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THE
INDIGENOUS PLANTS
OF
BENGAL:

BY
REV. J. LONG.



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"FATHER" LONG. *Ap. 9. 1887.*

The Rev. James Long, who died in London days ago at the age of seventy-three, was many ways a remarkable man. He passed the most important part of his life in India, where he was in the service of the Church Missionary Society, and especially endeared himself to the natives by his zealous endeavour to promote their social welfare. In 1861 he translated into English a drama 'Nil Durpan,' which exposed the tyranny of the indigo planters, and gave a harrowing account of the sufferings of the natives, and was, in fact, a sort of Oriental 'Uncle Tom's Cabin.' For this, and the opposition to certain phases of misrule of which it was a conspicuous example, Mr. Long was tried in Calcutta, heavily fined, and sent to prison for a month. During and after his imprisonment he was regarded by the people as a saint and hero. The name of "Padre Long" is still held in reverence by millions in Northern India. Mr. Long's enthusiasm as a social reformer, and his devotion to work that he regarded as a more essential part of Christianity than the preaching of doctrinal religion, brought him into some disfavour; but he continued to reside and travel about in India, with the northern portions of which he became well acquainted during an absence of thirty-one years from England. He rendered a service to the cause of popular education by translating into simple Bengali 'The Vicar of Wakefield' and several other English works. After his return to Europe he lived generally in London, but made frequent visits to Russia and other countries, devoting much of his time to the study of national proverbs and folk-lore, especially in their religious bearings. He wrote various books and papers on these subjects, but it is to be feared that the public will never get the full benefit of his extensive researches. Shortly before his death he assigned to the Church Missionary Society a sum of 2,000*l.*, to be spent during seven years in providing for popular lectures on the religions of the East.

May C.M.S. Gleaner.

THE LATE REV. JAMES LONG.



O many of the present readers of the GLEANER both the portrait above and the name under it will be strange; to others they will serve to recall the life of a remarkable man and devoted missionary—the Rev. James Long, for thirty-two years a C.M.S. missionary in North India. Mr. Long first went out in 1840, and at once began those active labours in connection with Christian Vernacular Literature and Education for which, as well as for his consequent familiar intercourse with the Natives of Bengal, he was conspicuous throughout his long period of service. Possessing as he did an unusual aptitude for the acquisition of Oriental languages and the storing up of large funds of Native book-lore, he had opportunities of reaching the educated Hindu denied to many, and these opportunities he fully embraced with the most hopeful results. Mr. Long retired from the mission field in

1872. He afterwards travelled far and wide in nearly every part of the world, and in particular devoted much time and thought to the condition of the Russo-Greek Church. One result of his travels was the compiling of a collection of Oriental proverbs in many languages, a most valuable and interesting volume. Of late years he was a regular attendant at the meetings of the C.M.S. Committee, and at those of several learned Societies in London, where his knowledge of a wide range of Eastern subjects always made him a welcome visitor. As an instance of the undiminished interest with which he regarded the work to which so many years of his life were given it may be mentioned that a few months only before his death he gave to the Society the bulk of his little property, about £2,000, leaving the Society to pay him so much of the interest as would meet his very modest personal needs; the money to be a fund for the support of lectureship on Oriental Religions. He died on March 23rd, 1887.



THE LATE REV. JAMES LONG.

*From the Journal of the A. N. S. of C.
Vol: 9)*

THE
INDIGENOUS PLANTS
OF
BENGAL.

*Notes on peculiarities in their structure, functions, use in
medicine, domestic life, arts and agriculture: by the Rev.
J. LONG.*

The object of the writer of this, is to draw attention to the native plants of Bengal, in the hope that they may be employed to a greater extent for medicinal and other purposes. The works of Royle, Roxburgh, and many other writers, Native and European, containing various notices of native plants, have been freely used.

EXOGENS, OR OUTWARD GROWERS.

*Plants having pith, wood and bark, with new layers of wood on
the outside of the old, leaves with netshaped veins.*

1st SUB-DIVISION.—THALAMIFLORÆ.

*Parts of flower mostly in five divisions; coverings of the
flower double; stamens inserted under the seed vessels:—*

1. *RANUNCULACEÆ*.—This order is abundant in Indian highlands; they are called "Crow Foots", because their leaves are shaped like a crow's foot; they are acrid.

Chágál Bâti (*Naravelia Zeylanica*).—A climber found in hedges; the seeds are tailed; the root tuberoscous. Fl. RS. In India. Flowers handsome, but juice acrid.

2. DILLENIACEÆ.—Beautiful trees with alternate rough leaves; Australia their head-quarters; astringent.

Chálitá (*Dillenia speciosa*).—A native of the Hill forests, said by Roxburgh to be, “when in flower, one of the handsomest flowers I have seen.” It is much prized in English hot-houses. The branches at the top form a beautiful, shady, spreading crown. The flowers are very fragrant, nine inches in diameter; the anthers bend out under the stigma, and form a large yellow globe in the centre, having the stigma bent back, and opening by two pores at the top. The flower-stalks are club-shaped. Fl. RS. The veins of the leaves are parallel and elevated, corresponding in number with, and ending in the margins of the leaves, shaped like the teeth of a saw; the leaves being very rough, are used for polishing. The leaf-stalks are channelled, and leave a permanent mark after they fall. The wood, being hard and tough, is used for gun-stocks. The fleshy leaflets of the calyx are used by natives to make curries or lemonade; they are fond of the fruit also. The seeds are very hairy, and are immersed in a gelatinous pulp. The wild elephants in Asam are very fond of the fruit, which appears in February.

3. MAGNOLIACEÆ, or *Pride of America*—where they abound in the swamps; a few found in Khasia and Nepal; bitter but aromatic: the stipules or leaf-stalk scales, when young, are rolled together to enclose the next leaf that is to be unfolded, as in the fig *genus* they soon fall off; leaves alternate.

Champá (*Michelia champaca*).—Famed for its fragrant yellow flowers, used by the natives in festivals, &c. The bees never light on its blossoms, owing to their strong aromatic scent. Indian women are fond of having them in their hair. Its Sanskrit names are —*subhag*, pleasing to the eyes,

and *hempushpa* golden-flowered, a name also given to the *Asoka*, China rose, maddar. The leaves are lance-shaped and waved; the leaf-stalks are marked on the upper margin with the scars of the stipules. The calyx is a conical, leathery sheath, bursting on one side, and falling off before the flowers expand. Fl. RS. The seeds destroy vermin. The sepals and petals are colored, and fall off. The bark of the root is used medicinally.

4. ANONACEÆ, or *Custard Apple Tribe*.—Trees or climbers, with alternato leaves. The innermost coat of the seed forms several plaits that enter the albumen.

Ālā (*Anona squamosa*.)—A native of South America. It is remarkable that this plant, like the tobacco (*tāmraakuta*), has Sanskrit names *sitaphal*, and *gandugātra*, “whose inside is like boils,” yet is not indigenous to India; it grows wild, however, over many parts of the Deccan. The leaves are oblong and blunt, and have a heavy, disagreeable smell. The seeds contain a highly acrid principle, fatal to insects; used by Hindoos, powdered and mixed with the flour of gram, for occasionally washing their hair. The fruit has, in some famines in India, proved the staff of life. When cultivated and pruned, during the hot season, it produces fruit afterwards of double the usual size. Fl. HS.

Nonā (*Anona reticulata*).—Bullock’s heart, so called from a fancied resemblance. Its native seat is the West Indies. It was brought to Asia viâ Philippines from South America, where its fruit is a great favorite among the Spaniards. The leaves are lance-shaped. The seeds may be swallowed whole with impunity, though the kernels are highly poisonous. Its bark is used for ropes; it is a powerful astringent, and a tonic much used in medicine by the Malays and Chinese. The fruit is much coveted by the gardener’s enemies, bats, squirrels and monkeys. Fl. HS. The flowers have the fragrance of ripe apples. Sanskrit name *ātripea*, pleasing.

Debdāri (*Guetteria longifolia*).—Mast tree. The leaves are lance-shaped, waved, shining. Birds eat the fruit. The wood is white; pencils and boxes are made of it, and, in China matches. Boys play with the seeds. Fl. HS. A native of South India. The *Barachūli* belongs to the same genus.

5. MENISPERMÆ, or *Cocculus* Tribe.—Twining shrubs. Roots bitter: seeds narcotic. The seeds of one kind are used for adulterating beer, and poisoning fishes: the stamens are not on the same flowers as the pistils.

Gulanča (*Tinospora cordifolia*).—A very common wild plant, climbs over the highest trees. The bark is corky, with many elevated rough specks. From the branches fibres often drop, which, as in the peepul, lengthen till they enter the ground, and form fresh stems, sometimes thirty feet long. Leaves five-nerved. The red berries are eaten by birds. The natives use a decoction of the root, stem, and leaves, in fevers. From fifteen to twenty grains of the powdered root are a good emetic. Its Sanskrit name is *amrita*, the immortal.

6. NYMPHÆACEÆ, *Water Lilies*.—Botanists have had much discussion whether these are exogens or endogens. The roots are used for food. Similar to arrow-root, the seeds are eaten. The bitter, astringent stems are used for food. These “ladies of the lake” are beautiful objects on tanks in Bengal—

Crowning the depths, as with the light serene
Of a pure heart.

Bara shāluk (*Nymphæa pubescens*) ^{a var. of *alba*.}.—Found in every part of India. The margins of the leaves are sinuate, i. e., bend in and out, toothed, downy underneath. The berries have twenty cells. The flowers are white, and have a vinous smell. There is another variety with pink flowers. The *chota shāluk*, *nīlpadma* (or *Nymphæa stellata*), has blue flowers and oval leaves.

Bara rakta kambul (*Nymphæa rubra*).—Has from twenty to twenty-five stamens, and from twelve to fifteen rays in the

Nymphaeaceae

(Hooker's Flora of British India, i. 113-115.)

Nymphaea

[The *Nymphaea* opens at night, the *Nelumb* blows by day.]

Large herbs; rootstock creeping. Flowers expanded, large, floating on long radical scapes. Sepals 4, adnate to the base of the disk. Petals in many series, inner successively transformed into stamens, all adnate to the disk. Filaments petaloid; anthers small, linear, slits introorse. Ovaries many, in 1 series, sunk in the fleshy disk, and with it forming a many-celled ovary crowned by the connate radiating furrowed stigmas; ovules many, anatropous. Fruit a sponge-like berry ripening under water; seeds minute, buried in pulp, enclosed in a sac-like fleshy aril.

N. alba. Europe, Siberia.

N. Lotus, common in India. Also Africa, Hungary, Java, Philippine Isl.
white, rose, or red; leaves 6-12 in. broad. Petals linear or ovate-oblong. Flowers 2-10 in. broad.

N. Stellata Common in India & Africa.

Flowers 1-10 in. diameter, blue, white, rose, or purple. Slightly odorless.

Petals 10-30, linear oblong or lanceolate.

Nelumbium.

An erect large water herb with milky juice; rootstock stout, creeping. Leaves raised high above the water, peltate.

Flowers rose-red, white or yellow.

Sepals 4-5, inserted on the top of the scape. Petals and stamens many, hypogynous, many-nerve, caducous.

Anthers with a clubbed appendage.

Ovaries many, 1-celled, sunk into the flat top of an obconic fleshy torus, attachment lateral; style very short, exserted, stigma terminal, dilated; ovules 1-2, pendulous. Carpels ovoid, loose in the cavities of the enlarged spongy torus; pericarp bony, smooth. Seed filling the carpel.

2 Species, one Asiatic & Australian, the other W. Indian.

N. speciosum, Persia, Malay islands, China, Japan, Tropical Australia.
^{smooth or with small scattered prickles,}
Peduncles & petioles, 3 to 6 feet high; leaves 2-3 ft. diam. membranous, glaucous, cupped. Flowers 4-10 in. diameter, white or rose. Petals elliptic, concave veined. Fruiting torus 2-4 inches diam.

stigma. Medicine from its root is used in measles. Its Sanskrit name is *hallaka*, the delighter—

“The sacred flowers that crown
The lakelet with their roseate beauty”

Its flower-stalk is used by natives in gamcs. Fl. HS. and RS. The *Chota raktakambal* (or *Nymphaea rosea*) has a rose-coloured flower.

Bara shandi (*Nymphaea* ^{var. of *N. stellata*} *versicolor*)—Has leaves shield-shaped, the posterior lobes of the margin overlap each other. The flowers are azure.

Chhota Shandhi (*Nymphaea* ^{var. of *N. alba*} *edulis*).—The rays of the stigma, ten to fifteen, bend inward. The berry is the size of a large nutmeg. The under-ground stems, or roots, are used by natives both as food and medicine. The flowers are very white, hence its Sanskrit names *kahlár*, the necklace of the water—hence a name of the moon is *kumudbandhu*, or a friend to this lily, which expands its petals to the moon's rays, but closes them in the day.

* *Padma* (*Nelumbium speciosum*).—Its flowers are beautiful, but inodorous; they are used in Hindu ceremonies to place at the foot of the idol. The Chinese in summer serve the roots up with ice, and store them up for winter in salt and vinegar. The root creeps in the mud, is jointed at various distances, has many pores; the joints in old plants often swell into tubulosities as large as a man's fist, from them issue leaves and flowers. The corolla has from fifteen to sixty petals. The anthers are linear, i. e., have the two sides parallel, and are crowned with a white pearl-colored club. The stigmas are funnel-shaped. The leaves are radical, have underneath innumerable small vesicles, which render the leaves specifically lighter than water, they have from fifteen to thirty nerves, and are used as plates. The leaf-stalks are very long, and are armed with prickles. This plant was formerly found in Egypt, but is now extinct there. The seeds will keep forty years, and then vegetate. Snakes nestle in this

the root is

*The fiber
come
out
round
these
joints*

lotus. The spiral vessels serve as wicks in temples. The Hindus compare a beautiful woman to this lily. Its Sanskrit names are *sitāmbhājī*, the fair daughter of the water—*pangkajā*, offspring of the mud.

7. PAPAVARACEÆ, *Narcotics*.—The poppy tribe. Oil of the seeds used instead of olive oil. Opium is the juice of the poppy.

Shealkántā (Argemone Mexicana, or Mexican Thistle).—Introduced into India three centuries ago from Mexico, it is now a common weed by the road sides throughout India. It was brought to England from Mexico, A. D. 1590, where its juice was used as an emollient in inflammation of the eyes. The whole plant is covered with strong prickles, hence the Spaniards called it *fico del inferno*—the fig of hell. The leaves, wrinkled and curved up at the margin, are bluish green, striped with white, and prickly. The calyx is prickly, and the bright yellow flower has a purple pistil in the centre, the stigmas forming a kind of cross at the top. The seeds are kidney-shaped and striped, when smoked with tobacco, narcotic; they yield an oil used for lamps in the Concan, and for the head when aching from exposure to the sun, applied also in cases of itch. In Jamaica and the West Indies, they are used as an emetic, a thimble-full being bruised with water, and given to drink: it is called there the golden thistle of Peru. The stem and leaves, when bruised, give out a thick glutinous yellow juice, used in ophthalmic cases. Fl. RS. The fresh root, bruised and applied to the part stung by a scorpion, is said to afford relief.

8. CRUCIFERÆ, *Cabbage Tribe*—called *crucifera* from their petals being four in number, shaped like a cross. There are more than 1,000 species in this order, but only a few are indigenous to the plains of India. They are stimulant and acrid, but cultivation diminishes this as in the case of the Night Shade tribe; contain sulphur and nitrogen, hence their animal odor when rotting. All are herbaceous.

Sarshedá (*Sinapis dichotoma*).—Mustard, conspicuous for its handsome yellow flower. Sown in November, the ripe seed gathered in February. The stem is dichotomous, *i. e.*, ramifies in pairs: the lower leaves have the shape of a lyre, and are white, the upper ones are triangular shaped. There are various species, as the *svet rái*, *bara rái*, *ban rái*, *bil rái*—all cultivated for the oil of their seeds.

Mulá (*Raphanus sativus*). *Radish*.—The root grows to the size of a man's leg; the seeds vegetate very rapidly; gives a good oil.

9. CAPPARIDÆ*, or *Pungent Flower Buds*.

Hurhuriyá (*Polanisia icosandra*).—Stem hairy, and glutinous; leaves finger-shaped; lower leaflets five from the same point; uppermost three; seeds have a net-shaped surface, used by natives for curries, and in Cochin China, instead of a mustard plaster. The stamens are of various lengths, the flowers appear in succession. The anthers, after bursting their tops are rolled back spirally on the same side. It is called in the Tamul language Dog's Mustard, and the juice, pounded, into the ear, is used for deafness.

Tikta Shák (*Cratæva Roxburghii*).—The leaves are divided into three leaflets. The flower is white, and becomes cream-colored, with purple filaments. Met with about temples and Musalman tombs; it is also a native of the Society Islands, and is planted near the abodes of the dead. Sanskrit name *barun*.

Kál okerá (*Caparis brevis spina*).—Grows in dry ground. The anthers are blue, the two upper petals of the flowers are tinged yellow. Seeds have a hard horn at the extremity, crescent shaped, with the ends rounded. Fl. CS. Fruit of a beautiful red color.

10. FLACOURTIACEÆ.—Flacourte was a director of the French East India Company. Some of this species make a good jelly.

Buinch (*Flacourtia sapida*).—The *tikádárs*, or inoculators for the small pox, use the thorn of this shrub for breaking...

the pustules of the small pox, on the ninth or tenth day. The leaves are egg-shaped, and have sharp, straight edged teeth. Fl. CS. The fruit is eaten by the natives, hence the Sanskrit name *Svādu kantak*, the sweet thorn.

11. LINACEÆ, or *Flax Tribe*.—Soft gummy seeds, but hard fibre. Herbaceous.

Masīnā (*Linum usitatissimum*) *Flax*.—Cotton is to the Hindus for clothes what flax was to the Egyptians. The Sanskrit name is *ataśi*, or bark made cloth. The stem, though it is only an annual, consists of woody fibre like that of a young tree. The seed, mixed with water, serves as a demulcent in diarrhoea; it is used by painters also for their colour. When the oil is pressed out, the seed-cake is used for fattening cattle and for manure, but it attracts white ants. When it is ripe, the capsule or seed-coat opens by dividing into ten valves, to discharge the seeds. The flowers are blue, and are arranged in, what botanists call, a cymbose panicle. The petals are five, sepals five, stamens five, the ovary has five cells, and there are five stigmas. The stamens are united at the base to a torus, from which proceed little teeth opposite the petals, indicating abortive stamens. The calyx and capsules are crenulate, *i. e.*, full of notches. The English make linen and lace from it. Fl. CS.

12. MALVACEÆ, or *Clothing Plants*.—These plants, composed of one thousand species, supply food, medicines, clothing, shelter. The filaments grow together, enclosing the style, and forming a column in the centre of the flower. Leaves have stipules.

Banokrā (*Urena lobata*).—Capsules covered with crooked bristles.—Fl. RS. A mere shrub, yet it is closely allied to the same order as the *Adansonia*, the giant of the vegetable world, one hundred feet in diameter, with its roots nearly double that length, whose trunks are used in Africa as tanks, in Abyssinia as bee-hives, and in East Africa for burying doctors and magicians.

Jabá (*Hibiscus Rosa Sinensis*).—The Chinese use the petals to make a black dye for their hair and eye-brows, and to black their shoes with. The petals when rubbed on paper give a bluish purple tint, very useful instead of litmus paper as a chemical test: they are also astringent. The Cochín-Chinese use the leaves as emollients. Its bladder-shaped inflated capsule has a fine transparent texture, covered with brilliant silky hairs, veined. The numerous seeds are attached to a central column. The roots are used by native doctors for snake bites.

Ban kápás (*Hibiscus vitifolius*).—Is a native of places abounding in rubbish: the leaves are five-angled, lobed, the flower is yellow and drooping. It yields an excellent strong fibre, equal to the finest quality jute.

Thal Padma (*Hibiscus mutabilis*).—The leaves are heart-shaped, five-angled. It changes the color of its flowers three times in one day; in the morning they are whitish, mid-day crimson, in the evening red. Very branchy, hence its Sanskrit names are *atichará*, going over—*chattra patra*, umbrella-shaped leaves—*padmacháriní*, having lotus-like flowers.

Poresh (*Thespesia populnea*).—The heart wood is very hard, is used for gun-stocks, but the white outside timber, like that of all the *Malvaceæ*, is soft and of little value. It has a remarkable tenacity of life; a large tree comes up in a twelve-month from cuttings, but though flowering freely, it is not reproductive, and requires to be planted from seed in order to be so. Flowers all the year.

Kárpás (*Gossypium herbaceum*).—Cotton was introduced into Egypt from India via Palmyra. The seeds of this species are clothed with a firmly adhering white down, which yields the cotton. It requires in Bengal a soil light, sandy, and moderately moist, as the roots send forth many slender delicate fibres. The soil must be light, well-broken, and the tap root must penetrate a certain depth to get hold of the soil; if the soil be too rich, the plant yields chiefly flowers, if too

moist, the root or seeds rot. A kind of caterpillar will sometimes in a night destroy a field of cotton, hence in some places turkeys are kept to destroy those caterpillars.

13. STERCULIACEÆ, or *Sweets and Stenches*.—Some of gigantic size. Anthers two-celled. This order includes plants like the fragrant *kanak champa* and the foetid *Sterculea*; it has a species, the *Durio zibethinus*, whose fruit is remarkably foetid, but its taste is delicious.

Rakta Simul (*Bombax Malabaricum*).—Red cotton tree. A handsome tree, particularly in February, when its red blossoms shine out, with the branches shooting out nearly horizontally from the stem, three from one point making amongst them three equal angles: they are thorny like the trunk, with numerous conical thorns, which however extend only as far up the tree as animals are likely to molest it. The trunk has projections like the buttresses of a cathedral. In the hilly districts these trees grow to the height of one hundred feet. The wood is light and spongy, used for floating rafters. In Java the bark of the root is used as an emetic, and a solution of the gum is given in conjunction with spices in certain stages of bowel complaints. The powder of the root is considered by natives efficacious to restore the vigor of old age. The leaf-stalks are as long as the leaves, which come out in sets of seven, the two smallest at the bottom falling off in the cold weather: when the flowers first appear in the hot season, there are no leaves on the tree; the flowers have a sweet liquid, which the birds are fond of: the downy filaments attached to the seeds afford a kind of cotton employed in stuffing pillows and clothes, but are not strong enough for weaving purposes.

Dupahariya (*Pentapetes Phenicea*).—The flowers are bright red, expand at noon, and drop by daylight next morning: the petals are triangular, the calyx double: the leaves are spear-shaped, the margins waved, the stipules are subulate, i. e., awl-shaped.

Kanak Champa (*Pterospermum acerifolium*).—The flowers are a pure white, and render water gelatinous. In Hindu poems the color of a beautiful female is compared to that of the golden champak. The leaves like those of teak when young, are covered with a star-shaped down; when fully grown, they are very hoary. The Sanskrit name is *karnikár*, i. e., having a seed vessel like an earring. There is another *kanak champa* with lanceolate leaves and yellow flowers, which belongs to the *Ochnáceæ*.

14. *TILIACEÆ*.—Mucilaginous leaves, but fibrous barks.

Pát (*Corchorus olitorius*). *Jute*.—There are thirty-six species of this genus. The leaves are used for pot-herbs; the fibre is largely exported, and much used for the manufacture of gunny bags*. Fl. RS. It is used in Bahar toasted with honey for bowel obstructions. It is sown in great plenty about Aleppo; the Jews there boil the leaves, and eat them with their meat. The capsules are eaten; they are cylindrical, and have transverse partitions between the seeds, which have a pyramidical shape.

15. *AURANTIACEÆ*, or *Orange Tribe*.—Have dots in the leaves, which are reservoirs of oily secretions. Fragrant. The petals fold over each other. Almost the only tropical order which has fruits that can be sent at a cheap rate to cold climates, and this owing to its spongy rind, and oily receptacles.

Ashshaurá (*Glycosmis pentaphylla*).—Leaves pinnate; the small white flowers fragrant; in flower all the year round.

Kámini (*Murraya exotica*).—Noted for the exquisite fragrance of its white flowers, hence called *kámini*, or the lovely. These flowers however remain in blossom only

* In 1830-31 the export of Jute was 11,155 maunds, valued at Rs. 23,482. In 1855-56 it had increased to 11,94,470 maunds, valued at Rs. 32,74,768. Its price 3 years ago was 1½ to 2 per maund. Its present price may be quoted at Rs. 3 to 3-12 per maund. In 1830-31, the export of gunnies was 26,66,493 pieces, value 1,66,700 Rs. In 1855-56 it was 1,96,73,752 pieces, value Rs. 26,61,731.

three or four days, but the tree flowers three times yearly; and flowers in the evening. It is found wild in hilly districts; was brought last century from China to the Madras coast, hence called the China box. The leaflets are generally three pair, emarginate, *i. e.*, have small notches at the end: the leaf-stalks have a gland. Easily grown by cuttings.

Kath-bel (*Feronia elephantum*).—Elephant or wood apple. A large tree: the bark yields a gum having the properties of gum arabic. The leaves are feathered with an odd one from three to five inches in length, dotted round the margin with pellucid specks. The young leaves when bruised have a pleasant smell; they are considered stomachic: the leaf-stalks are articulated, and somewhat winged. Fl. RS. The flower is greenish white; the pulp of the fruit affords a very pleasant jelly; the scent very unpleasant when dry: the cortex is used by fire-workers. The Sanskrit names are *kapithya*, residence of monkeys—*dadithya*, root yielding a juice like curdled milk—*grāhi*, constipating—*manmatha*, love—*danta shata*, bad for the teeth.

Bel (*Aegle marmelos*).—Great reverence is paid by the Hindus to this tree, which they call *shriphal*, *i. e.*, the milk of the goddess of plenty bestowed on mankind. The tree is sacred to Mahadeva, and is worshipped at the Durga Puja festival. The Malabar physicians reckon the root, bark, leaves, and flowers refrigerant. The tree is to be found in the gardens of all their pagodas. Europeans cut the unripe fruit into small pieces, dry them, and form a decoction very valuable in diarrhoea and dysentery. A sherbet made from the ripe fruit mixed with tamarind juice is used in fevers, and is most valuable in dysentery. The Javanese regard it as very astringent. The Dutch in Ceylon prepare a perfume from the rind, which is also used in dyeing yellow. The roots are very aromatic and bitter. On the Malabar coast a decoction of the root of the bark is considered a sovereign remedy for hypochondriac of the heart. The glutinous

transparent juice found round the small white seeds contained within the hard shell of the fruit has the smell of turpentine. The fruit is larger, and the shell much harder than in the *Kath-bel*. The leaves in threes are scattered at the end of the branches; the leaves in decoction are used in asthmatic complaints; the young leaves are used as poultices in ophthalmia. The stamens are red. The mucous which surrounds the seeds is a good cement. The thorns are in pairs. Fl. HS.

16. *SAPINDACEÆ*, or *Soap-tree Tribe*.—The stems of the climbers have several centres of formation, though only one of them occupies its axis. The *Lichi* belongs to this order.

Ritá (*Sapindus detergens*).—In Cochin China and Java the nut bruised and agitated in hot water makes a kind of suds for washing. Fl. HS. The Sanskrit name is *arisha*. One of this species, the *Saponaria*, is used by Hindustani physicians, for preventing supposed demoniacal possessions.

Ashphal (*Nephelium Longan*).—A native of China and of the mountains of East Bengal. The wood is close-grained and white. The leaves downy, with large parallel veins, when young of a reddish hue.

17. *MELIACEÆ*, *Tonics*.—Trees; stamens united into a tube. Compound leaves.

Nim (*Azadirachta Indica*) its Persian name, means the excellent tree; another species is called the Indian liliac, or bead tree, as the stones of the fruit are used in Roman Catholic countries for making beads. The seeds afford a very clear bitter oil, used for burning. The bark is used by Bengalis as a substitute for quinine, and in Java for worm complaints. The seeds after being skinned, are used for killing insects, and the kernels powdered and mixed with water, for washing the hair. The leaves scattered about the extremities of the branches beaten into a pulp, are used in bruises, cutaneous eruptions, or rheumatism of the head with great

success: after small pox the natives of Madras cover their bodies with nim leaves. The pulp of the fruit, which is poisonous, yields a very bitter oil used in rheumatism: the oily juice of the fruit is used for head-aches arising from exposure to the sun; taken before exposure to wet, it prevents fever. The fruit is at first green, then turns yellow, and at last changes to a purple color. On the *Nága Panchami* festival in August, natives smear the doors of their houses with cow-dung and nim leaves, as a preservative from poisonous reptiles. The timber is a pale yellow, and is used in ship-building, and in making idols; no insect will attack it, it is so bitter. Its Sanskrit names indicate its medical properties *arishta*, relieving sickness—*pichumarda*, leprosy-destroying—*nimba*, the sprinkler.

Amurá (*Amoora cucullata*).—A tree of considerable size, but of slow growth. Looks very bare in the cold season, being then without any leaves.

18. AMPELIDÆE.—*Vines*; acrid leaves; fruit, a berry; mostly climbers with tendrils.

Harajorá (*Vitis quadrangularis*).—The natives eat the young shoots and tender leaves in their curries. Jointed; four-winged. Beaten up into a paste given by the natives for asthma. The leaves are reniform, *i. e.*, kidney-shaped; one at each joint of the stem. The berry is red; very acrid.

Ban Chálitá (*Lea crispa*).—The leaves in fives; bruised, are used in wounds, their veins are parallel, running off at an angle of forty-five degrees, corresponding in number with the serratures of the margin, and ending in the points as in the *chálitá*. The stems are jointed, swelled above the joints, have six to eight short curled wings. The leaf-stalks have their wings curled. The margins of the flower-stalks are grooved, the flowers are conspicuous for their elegantly curled wings. Fl. RS. Grows wild in the bushes.

19. BALSAMINÆE.—*Pretty flowers*, loving moist shady places; at maturity the valves of the fruit separate, and expel

the seeds with an elastic force. In England they retain their vigor in the hottest day, but droop at night when other plants revive. Leaves lance-shaped, edges of them saw-shape. Linnæus knew only seven species of this order; now one hundred are known.

Dopátī (*Impatiens Balsamina*).—So called, because when the seed is ripe, if you even touch the seed vessel at both ends at once, it will fly asunder with so much force that the seeds will be scattered to a considerable distance.

Domuti (*Hydrocera triflora*).—Called in Telinga the Water oleander, and *Noli tangere* from the force with which the seeds are expelled on a mere touch. The Turks use it as a symbol of ardent love. The stem is piped, five-sided, interrupted at the leaves as in the floating plants.

20. OXALIDACE, or Acid Tribe.—Yield the *oxalic acid* in a crystallised form, a powerful poison. Their elastic integuments expel the seeds.

Kāmrānga (*Averrhoa Carambola*).—*Star apple*, used as an acid like the tamarind: it makes a marmalade. The Dutch, Spanish, and Portuguese physicians use it as an invaluable medicine for the sick in all inflammatory diseases, especially fevers and dysenteries. The leaves are sensitive, and are eaten by the Malays as sorrel.

Amrui (*Oxalis corniculata*).—A native of the Malay Islands. Its Sanskrit names are *chukrikā*, vinegar—*dantas-hatā*, noxious to the teeth. In Dacca the washermen use the juice of this plant to take out iron marks.

2ND SUB-DIVISION.—CALYCIFLORÆ.

Whose stamens and petals arise from the seed vessel, or the calyx.

21. RHAMNACE, or Buck-thorns.—Thorny shrubs. The thorns are undeveloped branches, and protect the plant in a barren soil, while when cultivated they gradually become branches.

Found everywhere, except in the polar regions. In China the leaves of one of this order are used as a substitute for tea, and the flower-stalks of another are eaten.

Kul (or *Zizyphus jujuba*.)—Easily recognised by its thorns and glossy green leaves, downy below, with three nerves. The natives are very fond of its fruit, and often get sick from eating too much of it, as it becomes sour and indigestible; it is like the English crab-apple. It is often attacked by a little worm, and at night by the large fox-bats, which sally out by hundreds, after the parrots, who have been feasting on it during the day, have gone to roost. When grafted, the tree produces a fine fruit. Humayan, the Emperor of Delhi, when defeated by Shir Shah, had to fly for his life, and this fruit was his only food in the desert of Rajputana; cough lozenges are made from it in England, and in the Moluccas it is used in diarrhoea. The leaves are three-nerved, green outside, white underneath. Sheep and goats are very fond of them, caterpillars (*Saturnia mylitta*) feed on the leaves, and by these a kind of *tasar* silk is made. Near the ruins of Gour the trees afford support to the lac insect. The stipules are thorny, the under one recurved, the upper sharp. The tree grows in hedge-rows about Geneva and Nice; its fruit is served up in Italy as a sweetmeat. The Musalmans are fond of cultivating it near their tombs; there are six varieties of this *Zizyphus* in the Mauritius.

Shyékul (*Zizyphus Ænopl.*)—Its leaves, like those of the genus, have three ribs. The acid fruit is a great favorite with the thirsty traveller, and with mice. The bark dyes leather red. Its leaves afford food to the lac insect, and to cattle. Fl. RS.

22. **LEGUMINOSÆ, or Bean Tribe**—contain species to be found in the snows of Lapland and the heats of India; floating in water and in the Sahara Desert; lowly herbs, and stately trees; nutritious as *papilionaceæ*, or purgative as *senna*, or gummy as *mimosa*, or acid as *tamarind*, or yielding a dye as *indigo*, or moving as *sensitive plants*; yet all known by their

Pods, a carpel growing long and flat, separating when ripe into two halves; no albumen.

Shan (Crotolaria juncea).—Indian hemp. The legumes are club-shaped, the stem is striated from the insertion of the leaves. Both sides are covered with soft silver colored hairs, and they are from two to six inches long. Flowers shape of a butterfly at rest, and a beautiful yellow. Leaves and flowers employed by natives as a narcotic. They have powerful intoxicating qualities. In the Northern Circars the natives feed their milch cows with the *sunna* during the dry season; it causes them to give much milk. The stem grows eight feet in two months, and so rapidly as to keep down the growth of weeds; the bark is separated by steeping in water its fibres, made into cordage and gunny bags. There are others of the same genus cultivated, as the *piyuli jghanjan*, *bil jghanjan*, *ban san*, *ohhota jghanjan*, *mana*.

Poung (Trigonella corniculata).—Fl. CS. Flower-stalks larger than the leaves; a pot herb; flower yellow. The *ban-piring* has a white flower.

*Hâkhuch (Psoralea corylifolia).—*The flower is pale lilac, with the wings and keel dark purple tipped. The seeds are aromatic and stomachic. It has at each joint a leaf two and half inches long.

Nil (Indigofera tinctoria).—Indigo. Prohibited a long time in Germany, where it was called "the devil's dye." Columbus found indigo indigenous at Hayti. Bengal produces about nine millions pounds of indigo, valued at two millions sterling. The flowers are purple; the corolla has an awl-shaped spreading spur on each side of the keel. Its spindle-shaped tap root, three feet long, enables it in times of drought, to obtain nourishment deep in the earth. The leaflets are five paired, used for coloring the hair. A fall of rain soon after sowing kills the insects which would otherwise prey on it. The coloring matter is the pulp separated chiefly by

fermentation in vats of water, the liquor extracted is green, but becomes blue from the oxygen of the atmosphere. The natives who stamp the plant get freed by it from all cutaneous eruptions. The Sanskrit is *mudhuparniká*, honey leaves. There is a common indigo plant that grows in the grass, the *blán-grá*. There are twenty-four different species of Indigo.

Aparájitá (*Clitoria ternatea*).—Common through Bengal. Flower blue, and remains the greater part of the year. Its root and powdered seeds considered good purgatives. Leaves winged. Corolla gives a blue dye, but not permanent. The Sanskrit name is *giri karniká*, “having leaves shaped like a mouse’s ear.” A native of Ternate in the Moluccas.

Dhanichá (*Sesbania aculeata*).—The fibres of the reddish bark are used for drag-rope nets, as it rots less in the water than *sunu*. They have of late years been converted by European manufacturers into rope for marine purposes. It is armed with inoffensive prickles. Fl. CS. Yellow leaflets twenty to forty pair. Legumes sharp pointed, eight inches long.

Kát Sholá (*Sesbania paludosa*).—Often twelve feet high. All the parts under water are very spongy, and emit numerous thread form roots. The parts above water are only one-third as thick. The leaves are horizontal, court the solar light during the day, and droop in its absence. Leaf-stalks channelled. Flowers bright yellow, with the back purple dotted.

Kálhasanda (*Smithia sensitiva*).—Leaflets, with the margins and foot-stalks ciliate, *i. e.*, hairs like the eyelash. Pods six-jointed, folded within the calyx. Cattle are fond of it, and it makes excellent hay.

Chámchiká (*Louria vespertilionis*).—Leaves highly colored; an uncommon looking, pretty plant; in flower and seed the whole year.

Banchárál (*Desmodium gyrans*).—In the day, the middle lobe of the leaf is horizontally extended: in the night it is bent, touching the stem; the lateral leaflets are moving all day, sometimes in a circular direction, by twisting their leaf-

stalks: the motion takes its round in two minutes, and there are two motions, the one up, the other down, but under a strong wind, the lobes do not move at all. No motion at night, the plant sleeps then. After the process of fructification ceases, the motion ceases, and the plant dies down to the root. In some parts of Bengal the people on Saturday cut off two lobes, when they are near together, and pound them along with an owl's tongue; with this the lover touches his mistress, to make her tender-hearted. Root biennial.

Kuddaliyá (Desmodium triflorum).—Helps to form the most beautiful turf we have in India. Cattle are very fond of it. The natives apply the fresh plant, bruised, to wounds that do not heal well.

Bat kaláy (Cicer arietinum).—Chickpea. In the Madras Presidency, an acid exuding from this plant is collected by the ryots, and is used in their curries instead of vinegar: flower bluish purple.

Bara chana (Vicia sativa).—Very common in a wild state; cattle fond of its leaves; when young the mark on the under side of the stipules is a glandular concavity, filled with a pellucid liquid, which dries up as the stipules get old.

Masur (Ervum). *Tare*—The *bara masur (Ervum lens)* has branches angular; the *chhota masur (Ervum hirsutum)*, has stems four-sided.

Matar (Pisum sativum) *White Pea*.—Stipules crenate, i. e., notched. Cultivated near Patna. It is chiefly the *chhota matar* or grey pea which is grown in Bengal, the *jangali matar* (or *Lathyrus aphaca*) has seeds which are narcotic when eaten abundantly, but when ground are quite harmless.

Khesári (Lathyrus sativa).—Has a blue flower, the pods have a double keel on the back; seeds produce palsy, when eaten.

Kunch (Abrus precatorius).—The seeds are used as weights by jewellers, each weighing one grain troy: as also in counting beads, hence called by the Germans the *Paternoster*

plant. One species has red seed, another white, another black ; the flowers are succeeded by pods containing the seeds, which are used in the Marquesas Islands as ornaments. The root is employed as a substitute for liquorice, hence its Sanskrit name *yashti madhu*, the hoaxed stick. Fl. CS.

Bara Sâlpâni (*Flemingia congesta*).—Fl. CS. Leaves in threes, leaflets three-nerved ; flowers beautifully striated with orange and purple.

Ban barbatî (*Phaseolus alatus*).—Kidney bean. Fl. CS. Flower deep rose purple ; roots eaten by the natives.

Mug (*Phaseolus* or *Gram*).—There are : the *ghorâ mug*, children eat the seed, the plant has too many stiff hairs to be liked by cattle—the *hâlî mug* or green gram much cultivated in the cold season and succeeds the rice as a crop—the *kâla mug* or black gram—the *sonâ mug* or yellow gram :—the seeds of the latter are eaten. In Calcutta, in Dr. Roxburgh's time, the price was Rs. 2½ for 84 lbs. From the *mâsh hâlîy*, bread is made for religious ceremonies. The *mugâni* or wild gram is a favorite with the poor.

Shim bûtrâjî (*Dolichos glutinosus*).—Flower yellow. There are various species as the *ban shim* with purple flowers ; the *suet shim* with white ; the *rakla shim* with red, the *bâgh nakha shim*, with its pods scythe shaped, and like a tiger's claw, the *châri kona shim* with a quadrangular pod, the *mâkhan shim*, and the *kâla shim* poisonous.

Âtkashi (*Mucuna prurius*).—Cow-itch. Common in hedges ; the hairs of the pods are used to poison wells in hilly districts. Its Sanskrit names : *âtmagupta*—self-preserved—*kapi kachu*, monkey-itching—The pods are black, and make a good vegetable.

Arar (*Cajanus Indicus*).—The seeds are known as *dâl* ; stem often as thick as a man's leg, produces a good fire by friction. Branches furrowed from the insertion of the leaves. The bractes concave, pods spotted with dark purple. There is one kind that requires seven months to ripen its

Bulca Scondosa. (Paläsa)

"The *Bulca Scondosa* was
abundantly in flower in
the same valley, and a
longer sight. In shape
the inflorescence resembles
sheets of paper, and in
dividually the flowers are
individually multiplied; the
bright orange-red petals
contrasting with the
pale green of the pistil
below the calyx."

Notes Himalayan C. 52.
Journals.

seed, but yields five hundred fold, another ripens in three months, but yields only one hundred fold.

Karanjá (Pongamia glabra).—A tree whose leaves fall at the close of the cold season. Stipules bent backwards. Calyx of a dark purple color. Wood very useful, cattle fond of the leaves: seeds yield an oil used by natives in itch and rheumatism. Its Sanskrit name *karanjika*, *i. e.*, water colored.

Náta karancha. (Guilandina Bonduc).—A febrifuge by the well-known name of *kát kalijá*. An ubiquitous plant, found on the burning shores of the tropics in both hemispheres, and, like the Coco palm, one of the plants which migrates or has migrated through the agency of the Atlantic and Pacific currents. It is a creeper. The seeds exceedingly hard, bruised into a paste, are taken with chiretta in fevers, they are very bitter and tonic. The calyx is one-leaved, salver-shaped. The thorns of the branches arch backwards. The nuts are worn as beads, and the boys use them as marbles. In Amboyna the people eat the nuts to make them strong. Leaves are bipinnate; stipules pinnate.

Bakam (Cæsalpina sappan).—Pods shaped like a trapezium. This tree affords the red wood of commerce, which is extensively exported as a dye wood. The dye is not easily fixed; nevertheless it is much used in India as well as in Europe.

Amal kuchi (Cæsalpina digyna).—Seeds yield an oil used in Jamps: stipules subulate, *i. e.*, awl-shaped; Petals streaked with red.

Krishna Churá (Poincianapulcherrima).—From its variegated flowers, orange, red, yellow, green, it has been called Peacock's crest: it is also named Barbados flower fence; in the West Indies, the French call it *Fleur de Paradis*. The petals are clawed and notched: the flower-stalks are pale green at the base, and become red above: the racemes are corymbiform, the stamens are longer than the petals, and are woolly at the base; it flowers the whole year. The seeds are divided from each other by a kind of spongy substance. The trunk, when

old, is generally hollow, and occupied by large dark brown ants, which, when disturbed, issue forth in numbers, and by their bite, inflict a severe wound on their disturbers. Leaves are green during the rains, afterwards become a bright red. From the leaves and bark a juice is extracted having some of the properties of gutta-percha.

Ashok (Jonesia asoka).—Called after Sir W. Jones, who was not only a good Sanskrit scholar, but also a good botanist. Its flowers, when they first expand, are of a beautiful orange color, gradually changing to red, fragrant during the night: pod scimitar shaped.

Tetul (Tamarindus Indica).—*Tamarind*, well known for its shady head and beautifully veined wood. The leaves called by botanists abruptly pinnate, are used for the eyes as collyria, decoction of them is applied externally in fomentations. The leaves are considered to have a damping effect, hence grass is seldom seen under the tree. Natives consider it unsafe to sleep under it, and in Scinde the natives say that a night spent under its cool shade gives a fever in the morning. The pods have a firm acid pulp, used in sore throat as a laxative, and to quench thirst, they are seven or eight inches long, and contain five or more seeds, shining, angular, which are eaten. Tamarind stone, when reduced to a fine powder, made into a thick paste with water, and smeared on the skin, rapidly promotes suppuration in blind boils: the same powder boiled into a paste with thin glue, forms one of the strongest wood cements. The flowers have five equal petals of a brownish yellow, three of them streaked with pink, the anthers are nearly of a rose color. The stamens and the style both curve upwards. The fruit is a fine preserve; one hundred tons of it are imported annually into England from the East and West Indies, and Brazils. Its Sanskrit names express its qualities: *tintirā*, damp—*chinchā*, edible—*chukrá*, vinegar—*gurupatra*, abundant in leaves—*dhàtri*, nurse.

Kálkásandá (*Cassia sophora*).—On May the 10th, the commencement of the Satyea Yoga, Hindu women worship this plant: five or six families proceed in company to the river with all the ingredients, and there worship it; its leaflets are scythe-shaped, eight to ten paired, the lower much smaller. A clavate or club-shaped gland is at the base of the leaf-stalk. Fl. CS. yellow. There is another variety, the *káلكálkasandá*, with a dark purple stem.

Dáda Mardan (*Cassia alata*).—Conspicuous by its beautiful yellow flower, and its leaves two feet long with channelled leaf-stalks. The fresh leaves are often employed to cure ring-worm, hence its Sanskrit name *dadrughna*. The Telinga and Tamul physiciaus say it cures poisonous bites. *Stipules* ear-shaped. Fl. CS.

Chákkundá (*Cassia Tora*).—The seeds, ground with some butter-milk, are used to ease the irritation of itching eruptions. It is foetid, mucilaginous, gently aperient. Its Sanskrit name is *parni*—leafly. The leaflets illustrate what is called the obovate cuneate shape, and there is a subulate or awl-shaped gland between each of the two lower pairs.

Káncan (*Bauhinia acuminata*).—Trunk scarcely any: leaves nine-nerved, the middle nerve ending in a short bristle between the lobes: leaf-stalks jointed at the base.

Lajak (*Mimosa pudica*).—Sensitive plant: leaves digitate, i. e., shaped like the hand spread open.

Kuchi kánta (*Mimosa rubiacalis*).—Flowers purple, gradually become white.

Páni nájak (*Desmanthus natans*).—Stem piped; between the joints, spongy bodies are formed, which prevent the plant from sinking. The roots have no connection with the earth. When the water leaves it, it soon perishes. Flowers reddish.

Sháákántá (*Acacia suma*).—The bark is remarkably white, hence its Sanskrit name *shaktuphala*, “white like barley meal;” the leaflets have fifty pairs.

Shirisha (Acacia sirisa).—Gum found on it. The flowers very fragrant.

Bábula (Acacia arabica).—Timber used for building. As in all the *Acacia* genus, the leaves are bipinnate. Gum is produced from this tree, but owing to the dampness of the climate it is not equal to the Arabian. All the cart-wheels in Guzerat are made of babul, and they are put together without a single nail; the wheel is salted when finished, and by the deliquescent property of the salt, is rendered proof against the dry air of the hot weather. The bark is used for tanning, and gives a red color. The leaves afford good food for sheep and goats: the pods are excellent food for milk buffaloes: also for making soap and calcining silver. Good charcoal is made from the wood. The best seeds for germinating are those vomited by sheep or goats, who will not digest them, or which have been boiled for two or three minutes in water. Its flowers are like scented golden bells—

Our rocks are rough: but smiling there
The *acacia* waves his yellow hair,
Lovely and sweet,
Nor loved the loss, for flowering in a wilderness.

The tree grows rapidly, and requires no water: hence it is suited for the desert. All over India it flowers and ripens its seeds at various times of the year. There are other species, the *shálsái bábulá* and the *guyá bábulá (Acacia Farnesiana)*, a sweet smelling species, the Sanskrit names are *vri*, enemy (by its thorn,)—*barbara*, curly-headed.

23. COMBRETACEÆ.—Astringent; bark and fruit used in tanning.

Bádám (Terminalia catappa) Country almond.—The kernels are equally as wholesome and nutritive as the almond, and yield a pure limpid oil; the branches rise in tiers, are vertical, decrease in length, and form a pyramidal head. The leaves are horizontal, growing in clusters at the end of the branches, hence the name *terminalia*; they are between

obovate and wedge-form, and turn red a little before falling off. In the South Sea Isles the bark and leaves yield a black pigment, with which the teeth are dyed and ink is made. The drupe or stony fruit is nearly two inches long, and grooved. It grows wild in Batavia. In Madras the levers of draw wells are made from its wood, and clothes are made from the fibres of the leaves; there is another species called the *babura* (*Terminalia bellerica*) the flowers of which are foetid, the bark yields a gum, and the kernels eaten in abundance are intoxicating. There is another species the *haritaki* (*Terminalia chebula*), whose fruit is called in the North-Western Provinces "mother of doctors," the galls of which are much used by dyers; harness-makers use the fruit to make blacking with. It is not a native of Bengal.

24. RHIZOPHORACEÆ.—Roots in the mud of salt swamps. The mangrove grows in the Sunderbunds: its seeds begin to germinate and send out roots while they are yet attached to the parent branches.

Kángkrá (*Bruguiera Rhedii*).—Wood yellowish; trunk generally dividing before it reaches the ground, like a parcel of hop-poles piled up in the form of a cone.

25. LYTHRACEÆ.

Dádmuri (*Ammannia vesicatoria*).—Leaves very acrid, have a strong, muriatic smell, used in blistering, bruised and applied, they raise a blister in half an hour.

Mendí (*Lawsonia inermis*).—"The Indian box," used for hedges, as it grows readily from cuttings; its flowers are greenish yellow, the smell is more pleasant at a distance than near. The leaves, beat up with catechu, dye the skin and nails of a reddish orange permanent color called henna: much used by Indian women, the Moslem women dye thair hair red with it. In Barbary and Upper India it is used for staining men's beards, the horses tails and manes red. It has four sepals, four petals, four stamens, four capsular divisions, germs four celled. The seeds are angular.

Járu (*Lagerstræmia regina*).—Calyx variously grooved on the outside. The timber is used in India to make knees for ships. Flowers of a dark blue; very beautiful. Seeds narcotic, bark and leaves purgative.

26. TAMARISCINÆ.

Iháu (*Tamarix indica*).—Fond of sandy river banks. Fl. RS. Very beautiful flowers. Galls astringent, used in medicine and dyeing. The ashes of those growing near salt water yield the sulphate of soda. The natives confound this with the *Casuarina*, which is a much loftier tree. The leaves are scaly. Used in Scinde for firewood.

27. ALANGIACEÆ.

Dákaiti phal (or *Alangium hexapetalum*).—Called also *akarkanta* and *bagh angkra*.—Wood beautiful, and fruit edible; roots aromatic. The Malays say it has a purgative property.

28. MYRTACEÆ.—Aromatic, with leaves dotted, generally opposite; veins at the margins of the leaves.

Peyárá (*Psidium pyrifera*). *White Guava*.—It has spread very much in Tahiti, and is much liked by the natives there, where it is so abundant in March and April that even the hogs will not eat it. In Jamaica the guavas are propagated by the pigs, which after tearing up the ground in search of roots, drop the undigested seeds of the guava into it. It also in Jamaica prefers low swampy places, that are inundated in the rainy season, and affords food and shelter to thousands of rats, which build like squirrels in its branches. The stony hardness of its seed resisting the digestive powers of animals, tends to disseminate it there in every direction: no pasturage will grow on the plains it covers. It came from Africa to India; it is a native of tropical America. Like all highly flavoured fruit, it is a great favorite with the Malays and Chinese. Europeans use a jelly made from it. The leaves are somewhat aromatic, and are much used in the Eastern islands medicinally, or as a substitute for the betel leaf. The wood of the old trees is exceedingly tough and

close-grained; it is used for gun-stocks, as it takes a good polish, and is rarely known to split with heat, or fracture from blows. The fruit is turbinate, *i. e.*, has the figure of a top.

Kala jam (Eugenia jambolana).—Bark whitish, astringent, dyes brown; branches form a handsome shady head; petals round. Fruits great favorite with man and bird, astringent. There is also the *Chota jam*, whose leaves and fruit are small, and not as edible.

Dálím (Punica granatum).—*Pomegranate.* It was called *Punica granatum* because its grained fruit was first found near Carthage, from thence was brought to Rome in Scylla's days. The cultivated species said to be introduced into India from Persia sometime before 1791: first cultivated in England in 1548. It came from Spain to Persia, and from Persia to China; it is held in repute as a cooling drink, a principal ingredient in many sherbets and sweetmeats: it is a fertile source of poetic allusion. In the South of Europe, and in Bombay, it is used as an ornament for hedges. In Persia it forms extensive woods. The rind and flowers were used by the Romans for medicine; red leather is dyed in Germany with its rind, which also produces a good ink as that from galls. On account of the profusion of the seeds, the ancients considered the pomegranate a mystical fruit, typical of abundance. A decoction of the bark of the root is employed by natives in worm diseases. The flowers and rind of the fruits are tonic and astringent, and used in dysentery; the leaves are pointed at each end, the flowers conical.

29. TEREBINTHACEÆ.—Turpentine tribe. Varnishers.

Am (Mangifera Indica).—*Mango.* Belongs to an order which yields the varnish, hence resinous matter abounds so much in some mangoes that they taste like tar and turpentine. The mango tree is held sacred by the Hindus, and is worshipped on Thursday, because Lakshmi, the patroness of wealth, loves its shade. Its Sanskrit name

is *chāta*, i. e., the juicy—*madhudut*, or the messenger of spring, when it blossoms—*madhycuganda*, moderate scent. The hardness of the stone is caused by the thickening of the membranous sides of cells by a hard sedimentary matter called sclerogen; the stones must be sown soon after they are taken from the fruit. The yellow flowers have one fertile stamen. Fl. C.S. Fr. H.S. Some old trees are fifteen feet in circumference. The lower branches spread horizontally to a great extent, the upper ones gradually ascend till they become nearly erect in the centre. Leaf-stalks thickish at the base. Petals five, as also sepals; anthers oval, purple. A gum from the bark, which age renders very hard, burns with a cracking noise, and is of a pungent taste. The fruit of its seedling is so liable to change, that if not propagated by grafting, the seedling of a sweet mango will bear sour fruits. Forty varieties in Java. Introduced into England 1690. Boils caused by eating too many, hence its Sanskrit name *amrā*, sickness.

Amrā (*Spondias Mangifera*).—*Hog-plum*. Grows to a large tree in the Coromandel mountains. Fl. H. S. Leaves feathery-shaped, with an odd one, have a very peculiar smell when bruised. Leaflets five pair. A gum from the bark in the hot season; it seems very like gum-arabic. Fruit eaten raw when ripe; before being ripe it is used in curries. Sanskrit name *madhuramlak*, sweet and sour.

30. CUCURBITACEÆ.—*Gourds*; annuals. Climb by claspers attached to the stalks; hairy, drastic, pulpy and refreshing; seeds yield oil, and are scattered in a fleshy substance.

Rákhilá Sasá (*Karivia umbellata*).—Stem five-sided; roots and fruit eaten by the natives.

Turmyj (*Cucurbita citrullus*).—*Water-melon*. Contains a red, pale juice, used much by natives in the hot season. The stem is furrowed, hairy, with lateral two-notched tendrils; its leaves are much divided. The fruit is $1\frac{1}{2}$ foot long, extensively cultivated in the Indian Archipelago. To

The Mango.

The Mango, which is
entirely the fruit of
India, as the Pine App-
le is of the Eastern
Islands, was now close
-coming, and a superb
sight. The young leaves
were purplish-green, and
the old ones as above
is the deep lurid hue
of the leaf that would be,
especially when the tree
was, as often occurs, divi-
dute, - one half the green
the other the red shade
of the young ones.

some all former made
of yellow, differing a
profound rather. 181. 181
to be pleasant.

Some's Stima. P. 61
Some's Stima.

the Egyptians it is both food and physic. In Senegal, the fruit sometimes weighs 60 lbs.

Mákhál (Trichosanthes palmata).—The fruit is a greenish, striped gourd; on being ripe it becomes yellow; pounded and blended with warm cocoa-nut oil, it is used for diseases in the ears. The pulp is a powerful purgative, yet at the Cape of Good Hope the gourd is rendered so mild by being pickled, that it is eaten; in the West Indies it is used for killing rats, and in Bengal by boys in games. The plant is common on the sandy lands of the Coromandel coast; in Northern Africa stuffings for mattresses are made of it by Europeans.

Uckheá (Momordica muricata).—Indian cucumber. Much used in curries. Sanskrit name *susavi*. Fruit covered with small sharp points, with tubercles between: found in every market. The *karolla* also belongs to this genus, but the fruit requires to be steeped in salt water before it is used, as it is bitter. The *golkákrá (Momordica mixta)* has a red fruit and yellow pulp; the tuberous roots are eaten.

Jjinga (Luffa fetida).—Leaves five-angled; fruit ten-angled; much used in curries served up with butter, pepper and salt. Another species, the *karala* or *luffa amra*, is violently cathartic, and emetic, and its ripe seeds are used for that purpose; the natives apply the juice of the young fruit to their temples to cure head-ache. The *dhundul*, or *Luffa pentandra*, has the lower leaves five-angled, the higher ones palmate; seeds black, irregularly pitted.

Kumará (Cucurbita Pepo).—Leaves very downy; fruit when young very hairy, when ripe the hair is gone, and it becomes covered with a white powder; the seeds are white; tendrils three cleft.

Kadu (Lagenaria vulgaris).—Pumpkin. Bottles are made from this; it is naturally very drastic, some sailors were once poisoned from drinking beer out of a flask made from the rind of this gourd; but cultivation, as in the potato, removes

these bad properties: from one variety of this is made the stringed instrument *sitár*, and a buoy for swimming across rivers, hence its Sanskrit name *alavu*, i.e., what does not sink. The stamens are curiously lobed and twisted; leaves tomentose, i. e., densely hairy; scent musky. In good soil it sends out shoots 40 or 50 feet long. On the continent of Europe it is used to feed cattle, its seeds yield an oil.

Chichingá (Trichosanthes anguina).—Snake Gourd. Fruit used universally; tapering shape. There is a wild species, the *banchichinga*, but not eaten.

*Pátol (Trichosanthes dioica).—*Leaf-stalks woolly, channelled, tube of the corolla trumpet-shaped. Though universally cultivated in Bengal, it was unknown on the Coromandel coast in Roxburgh's time. Sanskrit name *Karkásh chhuda*, hard leaf. An useful purgative.

*Bhui Kumrá (Trichosanthes cordata).—*Grows wild at the mouth of the Megna. The root, which grows to the size of a man's head, is eaten.

Kharbuj (Cucumis melo).—Melon. Originally from Persia. It is a creeper with palmate leaves; grows naturally in every desolate place. When the proportion of heat to light is considerable, a greater number of stamiferous flowers are developed, if otherwise, of pistilliferous. Melons are better in the N. W. P. than in Bengal; those of the melon tribe in Agra, which are cultivated on the sandy flats left by the subsiding waters of the Jumna, are famous.

Sasá (Cucumis sativa).—Cucumber. The seeds used in cholera.

*Phunti (Cucumis momordica).—*The fruit is from four to eight pounds weight; very like the common cucumber, but larger: when ripe it tastes like a melon, and bursts slowly in various portions. The fruit of the *khirá*, another species, contains sugar, and yields a mild oil.

*Kámkur (Cucumis utilissimus).—*The fruit is yellow, the size of an ostrich's egg; will keep for months if not bruised.

The seeds are ground into meal; oil expressed from them is very nourishing; the powder of the toasted seeds is a powerful diuretic, much cultivated in the Guntoor Circars, where they form a considerable article of commerce.

Saphari Kumrá (Cucurbita maxima).—Squash gourd. The fruit tastes much like a carrot. Torose, *i. e.*, elevated and depressed: leaves angular-toothed, hairy. It grows very rapidly, sending out shoots forty feet long, which will cover nearly half a biggah in a season. On the continent of Europe it is extensively cultivated for the feeding of cattle and hogs, while the seed yields an oil, suitable both for food and burning. In England it is eaten baked.

*Telá Kuchá (Coccinia grandis).—*A native of every hedge. Stems five-sided; leaves five-angled, with a few minute teeth round the margin; berry before ripe marked with streaks of white. Crows are fond of the fruit. The fruit is eaten raw. Its Sanskrit names are *bimba*, disk of the sun, which its red fruit is like—*raktaphalá*, red-fruited: it is used much as a simile in Hindu poetry, to denote pretty lips.

31. PAPAYACEÆ.

*Pepiaya (Carica Papaya).—*A native of the banks of the Mississippi, introduced by the Portuguese into India three centuries ago. On the West coast of Africa the sickening smell emitted by the flowers is considered the cause of much sickness. Each male flower has a rudimentary ovary, capable of becoming fertile. It seldom has branches; the stem is milk-yielding, succulent, cylindrical, hollow, and often, eighteen months after the seed is sown, it bears fruit. The leaves are lobed, sinuous shaped like the hand with the fingers expanded; the leaf-stalk is hollow. The ripe seeds when chewed have the flavour of Indian cross. The acrid milky juice of the unripe fruit is used generally in the Mauritius and Malay countries as a cure against worms in young children. The flesh of old fowl which feed on its leaves or fruit become tender. In Barbadoes the flesh of

animals hung to its branches becomes soft.* The Javanese regard the seeds as valuable against worms, and use them very much. The female tree will not yield ripe fruit if the male is not near it, though at Malacca it is common for the male tree to give fruit. In the West Indies, the fruit is eaten with pepper and sugar; in the French West Indies, the negroes use the leaves to wash their clothes instead of soap. In Barbadoes, the juice of the fruit is given to horses to reduce buffy blood. There are buds which give lateral branches if the top fail, showing how the tree can adapt itself to circumstances. It has a five-toothed calyx, corolla five-lobed: stamens ten, anthers turned inwards, stigmas five-lobed, placentas five, testa pitted, placentas spread over the whole surface of the carpels. The frost in the northern part of India is sometimes so severe as to destroy in a single night large *pepiayas*, its texture being loose. From its resemblance to the castor-oil plant, it is called *arankharbug*. The fruit is eaten both raw, boiled, pickled, and preserved. The tree is ornamental like the palm, the size and beauty of the leaf much admired by strangers.

32. PASSIFLORÆ.—Usually climbers. South America their head-quarters, where one of them, the *Passiflora cœrulea* grows thirty or forty feet high in a single season, and has a stem as thick as a man's arm.

Jumká (*Passiflora citriflora*).—Flowers very fragrant. *Passiflora edulis* and *quadrangularis* succeed well in various parts of Bengal, and appear to be naturalized in Ceylon.

33. MORINGACÆ.—*Horse-radish tribe*.

Shajiná (*Moringa pterygosperma*).—*Horse-radish tree*. The legume is an excellent pot vegetable; the leaves and flowers are eaten in curries; flowers used as a pickle in oil.

* Dr. John Davy however observes that the trials he made afforded "negative results, tending to prove that the effect on the meat was owing to other and incidental circumstances, rather than to any special power possessed by the plant."—(*Edin. New Phil. Journal*, Oct. 1855.

The green root has the appearance, taste and qualities of the radish. It is pungent; used as a stimulant in paralysis, and an oil from the seeds is applied in rheumatism and in dropsy. The leaves are irregularly tripinnate, *i. e.*, twice or thrice pinnate, with an odd leaflet; the leaflets stand on slender purplish leaf-stalks, waving beautifully in the wind. The flowers white, tinged with yellow at the base. The Javanese prize this tree very much for its legume, root, and seeds; in Jamaica the wood is used for dyeing a blue colour; the Koles in Orissa hold this tree in high veneration. Half the stamens sterile. A red-flowered species, *madhushigru*, found near Malda. India and Arabia the native countries, but now introduced into the West Indies, where a very pure sweet oil is extracted from their seeds, known in commerce as the oil of Ben; it is used by watch-makers, as it does not quickly freeze. A little of the juice added to mustard, makes it almost too pungent to taste. A gum made from its wounded bark. Its Sanskrit name *shigrumul*, sharp root—*gandha* scent, *i. e.*, its flower smells like honey—*shobánjan*, beautiful anointment, *i. e.*, its oil is good for the gout.

34. PORTULACÆ.—*Juicy plants*; insipid; no smell, dull green; half belong to the Cape of Good Hope.

Barabuniyá (*Portulaca oleracea*).—All over India, Ceylon, and Java. Leaves wedge-shaped, fleshy; flowers open at noon, and shut at two. In Cochín-China the seed considered emollient.

35. CRASSULACÆ.—Fleshy stems and leaves. Out of three hundred species in this order not more than two are found in the plains of India. Like cacti, resisters of heat, live on air; fleshy succulent leaves. Soil more of use for keeping them stationary than for nourishment.

Himságar (*Kalanchoe laciniata*).—An African plant. It has a wonderful power of resisting heat. One of this order, *Briophyllum calycinum*, was introduced into Bengal in 1799 by Lady Olive; it is now spread over the country. Its

leaves are said to be acid in the morning, tasteless at noon, and bitter in the evening, this is owing to the light causing the oxygen to exhale from the plant. If the growing leaf is suspended in the air, it will keep green for several weeks, and in the mean time yield from its glandular serratures a crop of young plants. *Echeveria* has the same property, so certain *Arums*, and *Gesneria*. It grows on dry spots, where even moss cannot grow, and draws moisture from the air. The succulent leaves are used by Mahomedans to clean ulcers and allay inflammation.

36. CACTACEÆ.—*Indian figs*. All natives of America. Leafless stems, some of which are flat as *Opuntia*, triangular as *Cereus*, cord-like as *Rhipsalis*, or melon-shaped as *Melo-cactus*. In Linnæus' time only 12 species of *Cactus* were known, now there are 400. Has a beautiful but short-lived flower; no distinction between calyx and corolla. One species supplies the red hue which tinges the cochineal insect red. 70,000 form one pound of lac, 400,000 lbs. weight of which are sent from Mexico to England.

Phani manasá (*Cactus Indica*).—This is probably not indigenous to India, but, like the rest, South American. Joints proliferous; the little caduceous bodies over the joints are leaves, which are sub-conical. Thorns very strong; their insertions are surrounded with numerous sharp bristles; flowers from the upper edges of the joints, of a beautiful yellow, opening only in the day. Its chief nourishment is from the air, hence it flourishes in the hot deserts of South America, the thick skin and few pores, enabling it to retain a store of moisture, as the camel holds water in its stomach. On Mount Etna and its volcanic fields it is this *Phani manasá* which the Sicilians employ to render those desolate regions susceptible of cultivation, as its roots readily strike into the fissures of the lava, bursting the largest blocks asunder, and by their gradual increase making the soil capable of being worked. It yields a large

cooling fruit sold there in considerable quantity. The donkeys in South America extract the juice when thirsty, stripping off the dangerous spines with their hoofs. It is used as a hedge plant in the Deccan, but it excludes air, and harbours venomous animals. Cultivators have an objection to it, as it spreads so wide, and impoverishes land. The stems are used in cases of tooth-ache and for corns.

37. UMBELLIFERÆ.—*Flowers umbrella-shaped.* Leaves much divided, sheathing, hollow; furrowed and hollow stem; seeds have aromatic oil; narcotic, acrid, but rendered, like the potato, mild by cultivation. 900 species.

Thalkuri (Hydrocotyle Asiatica).—Native parsley. Creeping in shady places.

Joán (Ptychotes ajowan).—Seeds taste like carraway, used in flatulent colic, and cooking. Anthers redish. Sanskrit name *Bráhma-darbá*, Brahma's sacrificial grass. There is also the *ban joán*, the seeds of which are used as a medicine for cattle.

Rándhani (Pimpinella involucrata).—Seeds used in medicine, in disease and diet; three-ribbed on the back.

Pántorási (Oenanthe stolonefera).—Roots jointed.

Pánmahuri (Feniculum panmori).—Seeds eaten in curries; an annual of four or five months duration. Sanskrit name *madhuricá*, i. e., sweet-tasted seeds.

Shulphá (Anethum sowa).—Seed used for curries, flatulence and colic. Sanskrit name *mishreya*.

Dhanyéá (Coriandrum sativum).—Fruit carminative; when unripe has the smell of bugs.

Gájár (Daucus carota).—Carrot. Introduced from Persia.

38. LORANTHACEÆ.—*Parasites with a stringent bark.*

Chhota mandá (Loranthus globosus).—Leaves three-fold; when ripe the pulp of the fruit is yellow, clammy and elastic, which makes it adhere to the branches of trees, where it germinates; petals-shaped like a thong.

Bara mandá (Loranthus longiflorus).—Common on mango trees.

39. RUBIACEÆ (or *Coffee tribe*).—Febrifuges; emetic; two stipules at the base of the leaf; 330 Indian flowering plants compose this order, to which quinine belongs.

Kadam (*Nauclea cadamba*).—Noted for its pleasant shade, erect trunk, horizontal leaves, and beautiful orange coloured flowers; the large white clubbed stigmas project from the corolla, forming a large orange head: used as a medicine. Its capsules shaped like a ship (*nauclea*). The holiest of Indian trees, fruit size of a small orange, eaten by the natives; stipules are triangular, seeds angular. Its Sanskrit names are *halipriya*, Vishnu's favourite—*jirnāparna*, old leaves, *i. e.*, rough—*karnāpurak*, *i. e.*, leaves resembling the ear-drops of a Hindustani earring. Fruit used in a game. There is also the *kali kadam*, with beautiful wood.

Gandha rāj (*Gardenia florida*).—A native of China. The seeds nestle in a firm deep orange coloured pulp used for dyeing. The flowers pure white, are generally double; the petals of a fleshy substance, which gives the corolla a peculiar wax-like appearance. Berries turbinate, *i. e.*, the figure of a top, with as many sharp ridges as there are divisions in the calyx. Another of this family, *G. lucida*, yields a resin which exudes in transparent drops, or tears, from the extremities of the young shoots, and especially from the flower buds. This resin is chiefly useful for its medicinal properties, which resemble those of myrrh; it is employed by the natives as an anti-spasmodic to children attacked with convulsions during dentition.

Khet páprá (*Hedyotis Burmanniana*).—Leaves of one species are ear-shaped: another species yields the Indian mudâr.

Ach (*Morinda tinctoria*).—The bark of the roots is used to dye red, the green fruits are eaten with curries; wood hard and durable, variegated with red and white, and is preferred to any other for gun-stocks; there is also the *ban ach*.

Mayná (*Vangueria spinosa*).—Armed with three-fold thorns, leaves and stipules three-fold. Fruit and berry edible.

Ranjan (Ixora bandhuca).—*Jungle geranium*. Flowers the whole year; when they first open, they are scarlet, then they change to crimson. There is no stem, but there are many branches, which spread close to the ground in a hemispherical form. Its botanic name *Ixora* is the name of a Malabarian idol, to which were offered the flowers of some of the species. Its Sanskrit names are *raktaka*, i. e., red-blossomed—*bandhujib*, a friend of life. One species of this is called “the flame of the woods.”

Jui (Pavetta tomentosa).—Branches cross-armed, ascending. The *kukurchura*, belonging to this genus, has leaves smooth on both sides: the *páluk jui*.

Káoyá ban (Coffea Bengalensis).—A native of Sylhet.

40. COMPOSITAE.—Flowers in clusters, so as to form one which is apparently single, generally yellow, with united petals; anthers adhere in a tube. Oil in some. Tonics. One-tenth of the plants in the world belong to this order, which comprises 1000 species; they have hairs which brush the pollen out of the anthers, and thus contribute to fecundity. Many bitter and aromatic, some poisonous, others nutritive.

Koksim (Vernonia cinerea).—Every soil and situation suits it, it is in flower the whole year; stem finely furrowed; seed hairy; leaves lyre-shaped: the *bara-koksim* has a smell of turpentine.

Somráj (Vernonia anthelmintica).—Pappus of hairy bristles. Fl. CS. Stem clouded with elevated purple spots, tube curved, seeds hairy. All parts of this plant bitter; the powdered seeds are used as a worm medicine.

Ban okrá (Xanthium orientale).—Fl. CS. Two to three feet high. Found near rubbish and rivulets. Sanskrit name *arishta*.

Surjeamukti (Helianthus annuus).—*Sun-flower*. Originally from Peru, where the Peruvians considered its flowers as emblems of the sun, they made golden images of the flower, and with them decorated their priests at the temples. The

Spaniards were surprised at the riches shown on these occasions; when they afterwards saw the plants glistening in the fields, they thought they were of gold. The sun-flower is said to turn its flowers in the direction of the sun, hence it has been called the Sultan of flowers—Moore writes—

The heart that has fondly loved never forgets
But truly loves on to the close,
As the sun-flower turns to her god when he sets
The same look which she turned when he rose.

Oil is extracted from the seeds, which also afford nutritious food for poultry and cakes for the North American Indians; leaves 3 nerved.

Hingchá (Enhydra heloncha).—Extending itself considerably over the surface of the adjoining pools of water.

Gendá (Tagetes erecta).—*African marygold.* Originally from Mexico like tobacco, though now considered as indigenous in Persia, China, and India. It is a great favourite with Indian gardeners, and also with the Chinese; and in Germany it is called the golden flower. The African marygold denotes rain if its corolla shuts after eight in the morning; the barley also forewarns of it by lengthening its awns. In Holland, when the monarchical party sided with the Prince of Orange, the republican party, in their hostility, rooted up all the oranges and marygolds in the gardens, and even prohibited the sale of oranges and carrots in the markets, on account of their colour. The true marygold, called *Calendula*, was thought to flower in the Calends of every month. In warm summer evenings flashes of phosphoric light have been seen to play round the petals. It opens its flowers *with the sun*. The modest yet glowing marygold was named so in honor of the Virgin Mary, hence also the name of the flower called our Lady's slipper. There are two species; the French marygold, *chhota-genda*, and the African, *bara-genda*.

Chandra mul (*Pyrethrum Indicum*).—A native of China; root biennial, has no stem; roots fragrant but bitter; used as a medicine and perfume; seeds with a margin round the apex; flowers impress a peculiar pricking sensation on the tongue when chewed.

Háñchuti (*Miriogyne minuta*).—Seeds used by natives for snuff.

Nág dáná (*Artemisia vulgaris*).—Indian worm-wood; named after the goddess Diana (*Artemis*); stalks channelled; leaves whitish below, green above, when rubbed have an agreeable smell. Employed by the ancient Greeks, and by the Chinese in medicine. Common in England. The *dáná* has bitterish leaves.

Kusum (*Carthamus tinctorius*).—Safflower; flowers used by dyers, the seeds for oil, and also in rheumatism.

3RD. SUB-DIVISION. COROLLIFLORÆ.

The stamens adhere to the corolla, which has all its petals united.

41. SAPOTACEÆ.—Milky; flowers hermaphrodite. 200 species. Gutta-percha belongs to this order.

Bakul (*Mimusops elengi*).—Named *Mimusops elengi* from a fancied resemblance of its flowers to an ape's face. Leaves a deep shining green; noted for its drooping very fragrant flowers; it grows wild only in the Rajmundry Sircar. Branches very numerous, with the extremities ascending, so as to form a most elegant globular thick head. The bark is astringent, used in medicine; two rows of sepals, two wheels of lobes to the corolla. Fruit sweet and astringent; which improve the colour of the skin. Musalmans plant this tree round their mausoleums.

Muawia (*Bassia latifolia*).—Flowers distilled yield an intoxicating spirit drank very much in Behar; seeds produce an oil used in making native soap.

42. EBENACEÆ.—*Ebony* tribe. Bark febrifuge. Black hard wood in some.

Ban gáb (*Diospyros cordifolia*).—Berry eight-seeded. Fl. HS. Another species, the *gáb*, (or *Diospyros tomentosa*) is a large tree; the astringent viscid mucus of the fruit is used for paying the bottom of boats. Fishing nets are steeped in an infusion of the fruit, to make them more durable.

43. JASMINEÆ.—*Night scenters*. Fragrant oil from the flowers; corolla salver-shaped, five or more cleft, yet only two stamens; petals fold over each other like tiles of a house. Have a tendency to ramble or climb.

Ban-mallika (*Jasminum sambac*).—*Arabian jasmine*. Very common in every jungle, owing to birds eating the berry, and dropping the seeds, which vegetate; the berries are a beautiful shining black. In the axils of the veins on the back of the leaves are tufts of down, as in certain *Gardenias*. The flowers offer a rich cup to the gay butterfly. In Tuscany, the damsels on their wedding-day deck themselves with a nosegay of jasmine, in memory of a girl betrothed to the Duke of Tuscany's gardener, who made a fortune by the sale of this jasmine, then known only to the Duke, who forbade any to be given away; but the gardener gave in a nosegay a sprig to his betrothed on her birth-day; to keep it fresh, she put it in the earth; shoots came up, a demand arose for it, she made a fortune, which she presented to her lover on her marriage-day. Hence the ladies in Tuscany have a proverb, "she who is worthy to wear jasmine flowers is a fortune to her husband"—

Brides, as delicate, as fair,
As the white jasmin flowers they wear.

Kunda (*Jasminum hirsutum*).—Anthers beaked; stigma clubbed.

Jui (*Jasminum auriculatum*).—Branches cross-armed, ascending flowers open in succession; lower leaves in threes. Sanskrit names *majadhi*, produced in South Behar—*ganiká*, country—*yuthicá*, a mixture.

Jati (*Jasminum grandiflorum*).—Flowers white, externally suffused with purple; commonly used to make *durbar* or wedding garlands. Climbing. Three or five leaflets, confluent, i. e., running into one another. Sanskrit names *suman*, handsome—*mālati*, presented to Vishnu. The corolla has purplish edges.

Singdhār (*Nyctanthes arbor tristis*).—Called the sorrowful tree, because its flowers, scentless by day, open at sunset, and at sunrise lie dead and scentless. Used by Indian ladies for garlands. In Bengal it flowers chiefly in the rainy season, but in Madras nearly all the year. The flower, is very fragrant, smelling like that of fresh honey. The orange tubes give a most beautiful dye, but it is not permanent. It is grown only from seed, hence there are few varieties. It was introduced into Pisa from Spain, and, to secure it, a sentinel was placed there by the Governor to guard it. Its Sanskrit name is *nishipushpa*, the flower of the night—

Plants which sleep while others wake,
Like timid jasmin buds that keep
Their odour to themselves all day,
But, when the sun-light dies away,
Let the delicious fragrance out
To every breeze which rounds about.

Branches square; leaves fall off in the hot season; used for polishing wood.

The *bela* and *bara-bel* also belong to this genus.

44. MYRSINÆ—Abound in insular localities.

Ban jām (*Ardisia humilis*).—One or more trunks from the same roots. Leaves glossy, wedge-shaped; juice of the berries bright red, but on paper it changes to a durable brown.

45. APOCYNACEÆ.—*Dog-banes*. Some are milky shrubs; poisonous, though with beautiful flowers; some are fibre-yielding. The embryo inverted. Corolla twisted before opening. Stigmas collected into a massive head, expanded at the base in the form of a ring, contracted in the middle. The Cow tree of Guiana belongs to this order.

Shyeeama latá (*Ichnocarpus frutescens*).—A twiner like the *malati*. Stalks and leaves used in the form of a decoction in fever. Roots currently employed in hospitals under the name of country sarsaparilla.

Hápar máli (*Vallaris dichotomas*).—A twiner. Juice used in wounds by natives.

Gulachin (*Plumiera acuminata*).—Every part is full of a tenacious white juice, which exudes plentifully on being wounded. Trunk crooked, eight feet high. Branches three-forked, swelled towards the ends. Leaves wedge-shaped, lanceolar, acute. Many straight veins run towards the circumference, and are lost in another waved vein, which surrounds the leaf within the margins; some one foot long. Leaf-stalks long, with a small channel on the upper side. Flowers succeed one another for a great length of time: on the outside tinged red, inside pale yellow: fragrance chiefly at night. Corolla funnel-shaped, divisions obovate. Seeds in thirty-five years once.

Karabi (*Nerium odorum*).—*Oleander*. Called the laurel rose. It is poisonous, hence its Sanskrit name *ashvagna*, horse-destroying—*payari*, horse's enemy—*shatapras*, one hundred darts. A decoction of its leaves forms a wash used in the South of Europe to destroy vermin on the skin, in Bengal for a blood-shot eye: its powdered wood and bark served at Nice as the basis of an useful rat poison. Seven French soldiers were in 1809 poisoned near Madrid by eating meat roasted on sticks of oleander used as spits. Prussic acid is obtained from it. The root is often taken by Hindu women to destroy themselves when tormented by jealousy. The bark of the root, and the sweet smelling leaves, are applied to sores. In the South of France they cure the itch by a wash made from its leaves and bark. Leaves contain tannic acid; they have no pores, but, in lieu, cavities filled up or protected by hairs. The pith is triangular in shape. There are four varieties—the *rakta*, with red flowers, the *swet* with white, the *lál*

padma with double, and the *swet padma* which flowers the whole year.

Chhátin (*Alstonia scholaris*).—Bark powerfully tonic, used by villagers in bowel complaints. Its juice valued for spleen and tooth-ache. Wood as bitter as Gentian.

Tagar (*Tabernaemontana coronaria*).—Tube yellow; flower white, generally double; fragrant at night; forked two branches. Stipules within the leaves and resinous; pulp yields a very beautiful colour. *Phirki tagar*, the name of the single-flowered one—*bara tagar*, of the double-flowered. One of this genus has such beautiful fruit and flowers that the Ceylonese say it was the forbidden fruit.

Karamchá (*Carissa Carandas*).—Has a gray bark; the branches two-forked, stand at nearly right angles, having sharp thorns in pairs at their division, hence its Sanskrit name *karmarda*, hand-bruise. The flowers are like jasmine; the fruit is used to make pickles, tarts, &c. It forms an almost impassable fence. The berries are a shining black.

China Karur (*Cerbera Thevetia*).—A large shrub, or rather, a small tree, with oleander-looking leaves, and pretty bell-shaped, bright yellow, sweet scented flowers; fruit size of a crab apple: it is easily propagated from cuttings. A native of S. America and the W. Indies; naturalized in Bengal. The seeds yield a good limpid oil, valuable for lubricating fine descriptions of machinery.

46. ASCLEPIADEÆ.—*Acrid milky juice*. The grains of pollen in this order are collected into waxy masses. The medicinal effects of some species originated its name from Æsculapius, the Roman God of medicine. Generally twining perennials. The seed-vessels are in pairs, and, on bursting, display a quantity of thistle-like down attached to each seed which floats them.

Anta mul (*Tylophora vomitoria*).—The root, given in a large dose, is an emetic; in a small one, purgative. A substitute for ipecacuanha.

Akhanda (Calotropis gigantea).—*Madar.* Abounds every where in India. Famous for its root, which is used in fevers, ringworm, leprosy, and rheumatism; also for making charcoal; it is often substituted for ipecacuanha. Tanners use its juice to take off the hair from skins, and the Rajputs to poison their daughters. The leaves are employed in dropsy, and, being warmed, are applied to any limb swollen with rheumatism; in Bahar, they are burnt for fumigating obstinate sores: the leaves are eaten by only three creatures with impunity—the grasshopper, caterpillar, and goat. A large cricket also feeds on its leaves. Each of the seeds in the large pod has cottony hair instead of a skin, and in Northern Africa a stuffing for mattresses is made from it by Europeans. Ten plants will yield one pound of a juicy substance like gutta-percha. The fibre is used for fishing nets on the Indus, and could yield a silky flax. This plant comes to maturity in a year, and requires neither water nor culture. Its flower has beautiful rosy purple points, and a fine white centre. The stamens have a kind of crown; the pollen is glutinous. The Arabs use the acrid milk to stupify monkeys which they wish to catch. The Nubians use the filament of the fruit as tinder. Sanskrit name *arkaparna*, sun-leaves—*pratápasha*, heat-destroyer—*ganarup*, many-formed. Grows in the most barren soils, and might be used to reclaim poor soils.

Duda lata or kerui (Oxystelma esculenta).—Leaves fall off in cold season. Sanskrit name *dughdiká*, as every part abounds in milk. Flowers furrowed with purple veins. The *shomlatá* of this genus yields a mild juice, used by thirsty travellers.

Chágul Páti (Cynanchum pauciflorum).—Juice very gummy; yields a very fine fibre. Its botanic name signifies the dog-strangler, i. e., it is poisonous.

Chágul bánti (Dæmia extensa).—Smell offensive. Furnishes a fine silky fibre. Follicles like a hedge-hog in shape, their native name means “like a goat’s nipples”.

Ananta mul (*Hemidesmus Indicus*).—Roots used by Natives for the thrush. The anthers and stigma are only half attached, hence its name. An emetic, and said to be a good substitute for sarsaparilla.

47. GENTIANÆ.—*Bitter tonics*. Ribbed leaves. Found on snowy mountains, and hot sandy plains. The *chiratá* belongs to this order.

Gimá (*Erythraea centaurioides*).—Stems four-sided.

Páñchuli (*Villarsia Indica*).—*Indian buck bean*. Floats on sweet waterpools, its roots often do not reach the bottom.

48. PEDALIACEÆ.—*Oil seed tribe*. Leaves emollient. Africa their head-quarters.

Til (*Sesamum Indicum*).—Leaves emollient; the upper always narrower. Sown in February, crop got three months after; depends much on the dew for moisture. On the 11th of Magh, when there are ceremonies in honor of Bhima, water and oil of *tila*, offered to the *pitris*, are considered equal to obsequies continued for one hundred years. Sanskrit name *atul*, unequal. The *krishna til* of a large size, and a dark color, is sown in June; it yields the gingely oil of commerce largely employed to adulterate olive oil.

49. CONVULVULACEÆ or *Jalap tribe*.—*Bind-weeds*. Herbs; twining; many with a purgative milky juice, arising mostly from the roots. Corolla plaited. 660 species.

Kalmi latá (*Rivea bona noa*).—Leaves used as a pot-herb. Found in abundance in Midnapore. Flowers expand at night, perfuming the air with the scent of cloves.

Bich Tárak (*Argyreia speciosa*).—Its Bengali name means destroyer of poison, *i. e.*, it heals wounds. Climbs to the tops of the highest trees. Veins parallel; under-side of the leaves covered with a silky silver colored down; leaves applied to boils, the upper side used in Madras to disperse boils, the lower to ripen them. The *chhota-bich-tárak*

(*Argyrea argentea*) or elephant-creeper, called also *samudra-shok*, ocean's joy, has pink flowers.

Bhui Kumrà (Bátatas paniculata).—Root purgative; flowers dark red purple. Eaten by cattle. Seeds woolly all round: powder of root used in spleen.

Lál Shakar Kunda álú. (Batatas edulis).—Sweet potato. Roots nutritious; this vegetable is cultivated in Scinde, and also by the New Zealanders. The *saphed* has white tubers.

Nil Kalmi, or Kálá danná (Pharbitis Nil).—Its seeds are an excellent and cheap purgative; they are roasted like coffee, and the powder given. Dr. O'Shaughnessy remarks of it—"In ten-grain doses it produces all the effects of jalap with certainty and speed; the taste is scarcely perceptible. The seeds sell four seers for one Rupee. We have thus a remedy of unparalleled cheapness, perfectly equal to jalap as a cathartic, superior to it in portability and flavor, occurring in all parts of India." Common through India during the rains. Its large blue flowers very beautiful, expand early in the morning, hence called in Virginia "morning glory."

Dudhiya or Dál Kalmi (Calonyction Roxburghii).—Stem runs the height of ten or twenty feet; flowers, very large and fragrant, open at sunset and close up the following morning. In the Circars it flowers in the cold season; in Bengal in the rains. Bark of the roots employed by Natives as a purgative; the root has been found to contain resin, fatty matter, volatile oil, albumen, starch, fibre, malic acid, and various salts.

Kalmi Shák (Ipomea reptans).—Forms a net work of vegetation on the surface of fresh water jheels. Stem piped, jointed, many fathoms long; flowers rose-color. Stigma two-headed. The tender top and leaves are eaten in curries.

Chhágál Kuri (Ipomea pes capræ).—Leaves two lobed like *Bauhinia*, boiled and applied externally by natives in colic.

In sandy beaches it binds the loose soil, and renders it fit to bear new grass.

Teori (Ipomea Turpethum).—Roots rubbed up with milk used by natives as a purgative.

Bhui Kámri (Ipomea Gangetica).—Stems strike innumerable roots from the joints; flowers a bright yellow, open late in the forenoon, and shut early in the evening.

Ban kalmí (Ipomea striata).—Fruit the whole year.

50. BORAGINACEÆ.—*Rough leaved*. Herbs having hairs rough to the touch; mucilaginous. Some contain nitre, and crack when thrown on the fire. The *Boraginaceæ* have round stems, while the *Labiataæ* have them square.

Hátsurá (Tiaridium Indicum).—May be seen at all seasons, with its blue lilac flower; it delights in rubbish and bye-ways. Its Sanskrit names are—*bhurundi*, earth-grower—*shrihas-tini*, what is held in the hands of the Goddess of Fortune. Stem dichotomous, *i. e.*, ramifies in pairs; juice of the leaves applied to painful gumboils, and to repel pimples on the face, and in Jamaica mixed with castor oil to relieve the pain of scorpion stings. Leaves wrinkled, margins curled. Flowers have no stalk, arranged in two rows on the upper side of the spike.

51. LABIATÆ (or Mint Order).—*Aromatic oil*. Lavender belongs to this order. Corolla two-lipped, and tube-shaped; stem square; tonics; aromatic oil in their leaves, which remains for years, even after the plants are dried.—Not so with the Jasmine order. Favorites with cooks and perfumers. Herbaceous plants; 1700 species.

Kála Tulsi (Ocimum sanctum).—This is a very sacred plant with the Hindus, being usually placed on a pedestal near a house or a temple of Vishnu. The myth goes that Tulasi, a female, wished to become the spouse of Vishnu, but Lakshmi (his wife) in jealousy changed her into the Tulsi shrub; Vishnu however promised to be with her under the form of a *salagram* or holy stone, this stone

is accordingly placed by Hindus near it. In the month of May the tulsi is watered from a pot placed over it. In the Eastern islands, it is cultivated with great care for the purpose of strewing on graves. On the Srirámnavami festival, 9th of Chaitra, the birth of Ram Chandra, ceremonies are to be performed with the tulsi leaves. The Native doctors render the poison of snakes fit for use by stirring it with the filtered juice of tulsi leaves. Ten ounces of the juice with one drachm of quicksilver, half an ounce of sublimed sulphur, half an ounce of dhunes, one drachm of sohage, two drachms of goat's milk, made into a thin paste with vinegar, and rubbed over ring-worm, are found very useful. The stem and flower are dark purple; all fragrant. The Sanskrit name is *parnáśá*, beautiful leaved. In England, the *rosemary*, one of this order, is used as a symbol of fidelity, for wedding garlands, and to spread over graves.

Bábuí Tulsí (Ocimum básilicum).—Its Latin name means *royal spice*. Sanskrit name, *mangoriká*, the beautiful. Flowers white. Seeds steeped in water swell into a pleasant jelly, used by Natives in cough and dysentery, very nourishing and demulcent.

Gulál Tulsí (Ocimum glabratum).—Flowers white.

Rám Tulsí (Ocimum gratissimum).—Flowers pale yellow, the most fragrant of all. The Chinese flavor many of their dishes with it.

Rám Tulsí (Ocimum ascendens).—No scent; flower pale rose-colored; stamens twice the length of the corolla.

Tulsí (Ocimum villosum).—Flower pale greenish rose-colored. Tender shoots clothed with much white soft hair. Juice of the leaves mixed with ginger and black pepper is given during the cold stage of intermittent fever; it is also prescribed to allay vomiting arising from irritation produced by worms. Sanskrit name, *arjáka*, the gainer.

Páthar Char (Coleus amboinicus).—The juice is used in colic, dyspepsia, producing an intoxicating effect; in

Cochin China in cases of convulsion or epilepsy. Flowers pale blue; rarely found in flower; stems creeping, succulent, fragrant, and eaten with butter.

Pání Kalá (Dysophylla verticillata).—Indian mint. Flower purple; filaments woolly. The *jal latá* or *Mentha fruticosa*, with its hairy stamens, belongs to this genus.

Pudíná (Mentha viridis).—Spear-mint. Like the pepper-mint (*Mentha piperita*) does not flower in Bengal.

Bhu Tulsi (Salvia plebeia).—Found also in New Holland and China.

Gobará (Anisomeles ovata).—Fl. CS. Leaves downy; flowers reddish purple. The whole plant has a strong camphoreous smell.

Svet básanta (Leucas procumbens).—Creeping stem; calyx funnel shaped, ten furrows.

Chhota halkasá (Leucas aspera).—Leaves used as a pot-herb. The plant has a considerable degree of a peculiar fragrance.

Bara halkasá (Leucas cephalotes).—Calyx ten divisions.

Halkasá (Leucas linifolia).—Flowers used to decorate idols. The Ceylonese attribute almost miraculous curative powers to this plant. The leaves are bruised and a tea-spoonful of juice given, which is snuffed up the nostrils, and used by natives in the N. W. as a remedy against snake-bites; the mongoose also eats it. The fresh juice is employed as a remedy against head-aches and cold.

52. VERBENACEÆ.—In cold climates mere herbs, but includes in India the *Clerodendron*, four feet high, and the teak two hundred feet.

Ban jám (Clerodendron inerme).—Flourishes near the sea.

Bámanháti (Clerodendron siphonanthus).—Fl. HS. Greenish white, with very long tubes.

Bhánt (Clerodendron viscosum).—It is generally found under the shade of large trees, in consequence of birds dropping their seeds there. Stamens curved, ascend until fecundation is over, then decline; calyx red, stem quadrangular;

leaves egg-shaped, but, when old, approach more to the lance form.

Nishindá (Vitea negunda).—Leaves bruised are applied to the temples in head-ache; and to the leaves of books to prevent attacks of insects. Pillows are stuffed with them to remove catarrh. Sanskrit name *sinduvára*, near the sea—*indrasuras*, the best juice.

Segun (Tectona grandis).—*Teak*. Introduced into Bengal by Col. Kyd and Lord Cornwallis. Flowerstalk quadrangular; flint in abundance in its wood. Often rises to the height of 200 feet: the leaves 20 feet long by 16 broad.

Bhui okrá, or *chota okrá (Zapania nodiflora)*.—Found in Europe, North America, and the isles of the Pacific. Sanskrit name, *vashira*.

Biná (Avicennia tomentosa).—Sunderbunds. Bark used in Rio Janeiro for tanning.

53. ACANTHACEÆ.—Herbs and shrubs. Seeds attached to curious hooked projections; leaves gave the model of the Corinthian capital. Calyx shaped like tiles. Bitter. Inhabit alike the marsh and moist and arid ground, the sea beach and the tops of the highest mountains.

Kántá kuliká (Asteracantha longifolia).—Flowers blue; stigma awl-shaped.

Shádá Játí (Barleria dichotoma).—Flowers white.

Játí (Barleria cristatá).—Flowers blue.

Kántá Jánti (Barleria prionitis).—Flowers yellow, and all the year; thorns in the axis of the leaves; leaves decussate, *i. e.*, cross each other at right angles; stigma pitted. Very much like the common English holly.

Hákuch kántá (Dilivaria ilicifolia).—Found near brackish water. It flowers all the year on the Coromandel coast; in Bengal only during the rains. Leaves dentate, *i. e.*, the margins having incisions like teeth. Calyx has three pair of leaflets; anthers very hairy. Very common in the swamps near Galle in Ceylon. Leaves spinous like holly. The veins

of the leaves are hardened at the extremity, and project in the form of thorns; the cause is that the development of the cellular part of the leaf is stopped, and a change takes place in the structure of the veins. Sanskrit name, *hankusa*.

Bâkas (Adhatoda Vasica).—It is a native of Ceylon. Fl. CS. The flowers have small ferruginous dots, and the lower part of both lips is streaked with purple. The corolla ringent, i. e., like a dog snarling. The wood is used for making charcoal by the Sikhs, and the flowers, leaves, and roots for anti-spasmodic purposes. The juice of the leaves is given in a dose of 2 drachms, with 1 drachm of the juice of fresh ginger, as an expectorant in coughs. Its Sanskrit names are *vajidântas*, flowers like a horse's tooth—*vaid-eamâtri*, physician's mother—*vaideasingha*, medical lion, i. e., its flowers, leaves, root are anti-spasmodic, and are given in asthma and intermittent fever.

Jâgatmadan; or Gandaras (Gendarussa vulgaris).—Bark, veins and leaves dark purple; the lower anthers have a spur-like process, projecting downwards and upwards. Leaves have, when rubbed, a strong, not unpleasant, smell, and are used, when roasted, in cases of chronic rheumatism.

Kâla Jânti (Eranthemum nervosum).—Stems many. Flowers bright purple.

Udu Jâti (Justicia dentata).—Flowers azure. To this genus belong the *chota michetâ*.

Jui pânâ (Rhinacanthus communis).—Roots rubbed with lime-juice and pepper used to cure ring-worm: never ripens its seeds: supposed to be a snake antidote. Sanskrit name *Yuthakâ parni*.

Bet rang (Peristrophe tinctoria).—Flowers in October.

54. SOLANEACEÆ.—*Potato tribe*. Nârcotics or stimulants. Plaited corolla. Used as food, medicine, or poison. Cooking or blanching destroys the poisonous properties, as in the potato, whose leaves and berries are narcotic.

~~now~~ ^{now} that he was an ~~apple~~ ^{apple} ~~will only yield fruit once~~ like a radish.
 52 The indigenous plants of Bengal.

Káphri Marich (*Capsicum grossum*).—Flowers white. There is also the *lál langká marich*, with an orange fruit, the *haldi langká* with yellow, and the *dhán langká* called *chili*, because of its American origin. They are in Mexico to food what salt is in India.

Gorkhi (*Solanum rubrum*).—A common weed in Bengal, but in the Mauritius it is cultivated as a pot-herb. With flowers and ripe seed the whole year round.

Aras (*Solanum verbascifolium*).—In the Telinga country this is a tree; berry the size of a cherry.

Gola begun (*Solanum torvum*).—Leaves have flattened prickles. The *Godh begun* (tomato or love-apple) is of foreign origin.

Begun (*Solanum melongena*).—*Brinjal* or *egg plant*. In a poor soil they have many prickles, but in a rich one, few.
 X Blossom and bear fruit the whole year. Leaves obliquely egg-shaped. The plants are annually raised from seed, though all the varieties are perennial, but, like the *chilis*, they are not so productive after the first year. Called in Sanskrit *sinhi*, the lion or pre-eminent egg plant. There is a variety, the *kuli begun* (*Solanum longum*) which has its fruit cylindrical, whereas the *begun's* is oval.

Byákur (*Solanum indicum*).—Berries a deep orange yellow.

Rám begun (*Solanum ferox*).—Leaves double.

Kantakúri (*Solanum Jacquinii*).—Berries yellow when exposed to the sun, white when sheltered. Sanskrit name *kshurika*, the scratcher, i. e., with its thorns. The seeds used in tooth-ache.

Ashva Gandha (*Physalis somnifera*).—Employed by the Telinga physicians as an antidote to poisons. Though naturally perennial, yet the plants are reared annually from seed, as they are not fruitful after the first year.

Tepariyá (*Physalis Peruviana*).—*Indian goose-berry*. Yellowish palatable berries, which yield an excellent preserve.

Ban Tepariyá (Physalis minima).—Branches furrowed.

Dhutura or Thorn Apple (Datura-alba) Stramonium.—
Called the thorn-apple, as its fruit is a round ball surrounded with thorns. All over India, though not a native of India, but of South America. Of this Bishop Heber writes—

While to the cooler air confest
The broad datura bares her breast
Of fragrant scent, and virgin white,
A pearl around the locks of night.

Of the same order with the potato, though so violent a poison, as to be called “the rogue’s friend,” the seeds being used by thieves to stupify persons whom they afterwards rob. Similarly, the Scots once being compelled to supply the Dances with food, mixed bella-donna juice with it, and, during the state of intoxication that ensued, cut off nearly their whole army. The Malays use it for stupifying their victims. Called in Sanskrit, *khal*, the wicked tree,—*már*, death—*ummatta*, making mad—*kitáva*, a gambler—*dhurta*, cheating as a jackal—*dhustura*, destroying elegance—*kanaká*, shining—*sumana*, beautiful. In France it is called *herbe aux sorciers*, as also *trompette de jugement*. The fruit has four valves; thorny. The corolla is shaped like a funnel or trumpet, and plaited as it was in the bud; the calyx is angular; the capsule is four-valved. Eleven different species, some in Abyssinia, others in America. The dried leaves and roots of the *kála dhuturá*, called in England herb tobacco, are smoked for asthma, and the powder is used for violent head-aches; it enlarges the pupil of the eye. Seeds made into pills good for a decayed tooth. Chinese use it in tricks in trade. The juice is mixed with arrack, to make it more intoxicating. The calyx five cleft, breaking off after the flowering, leaving a wide ring round the seed-vessel.

Stramonium in the deep and death-like trance
Thy potent spell the spirit binds.

The capsule encloses the stamens, and is covered with spines.

The *kāla dhutura* has the two sides of the leaves unequally ovate; pericarps tubercled, margins lobate, and flowers double. The leaf has several salient angles on the margin, and is angularly toothed. The dry root smoked removes spasmodic asthma. The seeds of the *kanak dhaturá* are never used medicinally, unless previously boiled with milk.

4TH SUB-DIVISION.—MONOCHLAMYDEÆ.

One floral envelope, i. e., single, not consisting of calyx and corolla. Some of the best timber trees belong to this sub-division.

55. PLUMBAGINACEÆ.—Astringents. Corolla funnel-shaped.

Chitá (Plumbago Zeylanica).—Stems many-jointed; leaf-stalks chanuelled. The roots reduced to powder, and made into a paste, with a little congee, are applied to the skin to produce a blister; used in the South Seas also for the same purpose. The root used in combination with *bishtali* is applied in cases of enlarged spleen, and as a tonic in dyspepsias; in the Sandwich Islands it is employed to stain the skin permanently black. Corolla plaited, with a solitary seed, suspended in a curious manner by a spring, that arises from the base of the ovary, and twists over the seed. Sanskrit name *agnimukha*, fiery face. There is also the *rakta chita*, with red flowers; mixed with strong vinegar, it is rubbed on leprous sores.

56. PLANTAGINACEÆ.—Astringent.

Isáph Gul (Plantago Isphagula).—Seeds steeped in water used as an emollient for coughs; they are convex on the outside, concave within. Leaves three-nerved; flowers arranged like the tiles of a house.

57. NYCTAGINACEÆ.—Roots purgative. Flowers of some blow at night.

Krishna (Keli Mirabilis jalapa).—A native of Peru ; introduced into the Calcutta botanical gardens about 1794. In Ceylon there are four varieties: purple, yellow, white, variegated. Called by the English “the marvel of Peru,” and by the French “the beauty of the night,” as it then expands its richly dyed corollas of various colours, yellow, white, red and white, red and yellow, hence from shunning the light of day, it was used as the emblem of timidity, as the sensitive plant was of modesty, which latter is affected by even a cloud passing over the sun. The females of Japan prepare with the powder of the seed a kind of white paint for their faces. The flower is only a petaloid expansion of the calyx, not a corolla. The stamens, inserted on the receptacle, grow from beneath the pistils, adhering together at the base, so as to form a kind of cup. If a skin of the leaf be lifted up a little, spots are observable, these are *raphides*, or needle-shaped transparent crystalline bodies, which are to plants what calculi are to animals ; they are made of phosphate of lime. The base of its thin membranous calyx is converted into a tough or bony shell, which acts as a pericarp to the seed. The natives think its root is aperient ; Europeans once thought that it was the true Jalap plant.

Gádá purná (Boerhaavia erecta).—Purgative and emetic, but heat removes those principles ; common through India ; its spindle-shaped root strikes so deep as to render it difficult to eradicate. Sanskrit name *purarnava*.

58. AMARANTHACEÆ.—Flowers in dense clusters ; called the undying ones, because their flowers retain their bright colors even when dead, the closed calyx retains the leaves even when dead. Leaves sweet, gummy. Few in cold countries. Some of this species have high medical repute ; and in Brazil they have a name which means good for every thing—as if everlasting flowers could confer immortality on man—yet they are mere pot-herbs.

Lata Mahuriya (Digera muricata).—Stem, when young, erect, ever afterwards prostrate. Leaves and tender tops used by the natives in their curries.

Ghol mahini (Deeringia Indica).—A climber, has bright red berries; one of this genus, the *viridis*, used in Java for measles.

Ghintí Nati or Jil Chumli Chukni. (Amaranthus tenuifolius).—Leaves wedge-shaped, no stem, but lateral fibres of a bright pink.

Cheru Nati or Chila Nati. (Amaranthus polygonoides).—Leaves obovate, grows wild; used very much by native convalescents as a pot-herb.

Champa Nati (Amaranthus polygamus).—Branches furrowed; leaves thin, shape of rhombus, bristly. Used in bilious disorders, and as an aperient. Sanskrit name *alpamarish*, a little enemy. There is also the *lál champa natíyá*, a reddish variety.

Gobará Nati (Amaranthus lividus).—Stem and leaf-stalks bright red, leaves dull greenish purple.

Shádá Nati (Amaranthus oleraceus).—Leaves vary in shape, from broad rhomboidal to egg-shaped and spear-shaped. The tops of the young stems and branches were formerly brought to table in India, as a substitute for asparagus.

Lál or Ranga Shák (Amaranthus Gangeticus).—Various shades of red, like the species the English call “love lies bleeding.” If cut, no crop from the same root.

Báns páť Nati (Amaranthus lanceolatus).—Means the bamboo-leaved amaranth; capsule circumsised and wrinkled.

Lál Nati, or Rangá ká Nati (Amaranthus atropurpureus).—Leaves above a shining crimson, below purple.

Tun tun Nati, or Ban Nati (Amaranthus fascicatus).—Green in every part, with the exception of a crescent-shaped fillet of paler green crossing the centre of the leaves.

Kántá Nati (Amaranthus spinosus).—Sharp spines in the axils of the leaves.

Chháyá (*Eruá lanata*).—Woolly branches, roots given in decoction, in strong whey.

Nuriyá (*Eruá scandens*).—A climber.

Shvet murgá (*Celosia argentea*).—Cockscomb, i. e., crested flowers. Some of the species appear as if they were *singed*, hence the name *Celosia*. Assumes very different appearances according to the soil or situation. Plants from the same seed have leaves of very various breadths.

Lal Murgá (*Celosia aristata*).—Cultivated for the sake of its strange looking, beautiful, crested flowers. There is also the *haldí* or yellow sort. The flowers are astringent, and are used in diarrhœa.

Lálgul Makmál (*Gomphrena globosa*).—At first erect, by age spreading. Flowers crimson; the *saphed* is white. Sanskrit name *ámáná*. The native women wear them in their hair: in Catholic Europe they are used for decorating churches. Thus Milton—

Immortal amaranth, a flower which once
In Paradise, fast by the tree of life,
Began to flower.

Rakta shelenchi (*Psilotrichum ferrugineum*).—Stem four or five-sided and rust-colored.

Apáng (*Achyranthes aspera*).—Its botanic name so called, because its floral envelopes resemble chaff. Sanskrit name *madhukar*, honey-maker—*apamarga* the washerman, as the ashes are used in washing linen. Flowers bent back. Fruit nearly the whole year. Leaves green on both sides, dotted underneath, taken fresh and rubbed to a pulp are applied externally to the bites of scorpions. Root used on the Coromandel coast for a tooth-brush, in Bengal for snake-bites, and also in dropsical cases; given in an infusion as a mild astringent in bowel complaints. The flowering spike made into pills, with a little sugar, is a popular preventive medicine in Bahar for persons bitten by mad dogs. The

whole plant, when macerated, yields a considerable quantity of potash.

Daiya khaiyā (*Desmochata atropurpurea*).—Biennial. The flowers grow as if in a sheath.

59. CHENOPODIACEÆ.—*Indian cabbage tribe*. Leaves fancied to be shaped as a goose's foot, hence the name; no corolla. Sugar made in France from the beet, one of this order. Leaves of another of this order used in Mexico for tea.

Jadupálang (*Salicornia Indica*).—In salt marshes. Yield an ash valuable in making soap and glass. This genus *Salicornia* has but one stamen.

Pinish (*Spinacia tetrandia*).—Used as a pot-herb. Leaves have triangular lobes; stem reddish.

Pálang Shák (*Beta Bengalensis*).—Belongs to the beet root genus, from which 9,000,000, lbs. of sugar are annually produced in France. The leaves are used by natives in curries. The mangel-wurzel belongs to this genus, and might be used in feeding cattle, as the roots often weigh 60 lbs.

Betu Shák (*Chenopodium viride*).—Leaves trowel-shaped. There are also the *lál betu*, the angles of the stem and branches are of a fine purple colour, and the *chandan betu*. The leaves of another kind, the *C. album*, stink like putrid salt fish.

Pui Shák (*Basella cordifolia*).—A valuable pot-herb, the Indian spinach. A climber. Its succulent branchlets and fleshy leaves protect native houses from the sun. The wild species, *rakta ban pui*, is also a climber, has its stem red; the beautiful purple juice afforded by the fruit might be used as a dye. There are also the *rakta pui*, *saphed pui*, and *ban saphed pui*.

60. POLYGONACEÆ.—*Sorrel Tribe*. Ditch growers; some however grow on sandy soils. Herbaceous. Leaves sheathing with large stipules, boot shape, acid; fruit a triangular nut. No calyx. Its jointed stems give the order the name *Polygonum*, i. e., many knees. Roots nauseous purgatives,

though the leaves are acid and agreeable; no petals. The rhubarb belongs to this order, and the buck-wheat,—the rice of America.

Páni Marich (Polygonum flaccidum).—The sheaths which surround the stem are shaped like a boot. Leaves lance-shaped, but their base heart-shaped; seeds three-sided. In the *bara páni marich* the ends of the succulent branches, on being wetted, become covered with a gummy substance. The *suet páni marich* has white flowers, woolly leaves, and a stem red internally, the stem below procumbent, striking root from the joints that rest on the ground. The leaves of one species give a good indigo dye, and those of another are smoked like tobacco.

Ban pálang (Rumex Wallichianus).—In Bengal abundant in dry weather, but perishes at the first approach of the rains. Calyx 3 leaved; petals 3; seeds 3. Bitter and astringent.

Chuk pálang (Rumex vesicarius).—Indian sorrel. A favorite medicine in Arabia, cultivated all over Asia. Used in food for an acid curry, and as medicine. Sanskrit name *shatavedhin*, i. e., piercing one hundred times.

59. LAURACEÆ.—*Aromatic tonic tribe*. The camphor and cinnamon belong to it. Anthers burst by recurved valves. Naked fruit. Scarcely any species found on the continent of Africa.

Kukur Chitá (Tetranthera Roxburghii).—A native of the northern Circar hills, where it grows to be a middle sized tree; anthers four-celled, with an oval lid to each cell; leaves above shining; bark astringent; fruit yields a greasy exudation. The *bara kukur chitá* has the leaves downy beneath.

Ákásh valli (Cassyta filiformis).—Air plant or Laurel dodder. A leafless parasite. Anthers, when ripe, spring from their enclosures.

60. ARISTOLOCHIÆ.—*Bitters and Climbers*. They form a link between Endogens and Exogens. Famous in South

America and Egypt for stupifying snakes with. In South America the flowers of one species are so large that the children use them for hats.

Ishwar Mul (Aristolochia Indica).—Root very bitter, used in dyspepsia and for snake-bites; also the juice for coughs and asthma. The leaves, stalks, bark and root, are bitter; capsule hexagonal; flowers have one lip much longer than the other; the tube takes an abrupt bend near the middle. There are 6 anthers fixed very curiously on the outside of a club-shaped column, split into 6 lobes at the point. In the centre of this column is a style with a 6 rayed stigma.

61. EUPHORBIACEÆ.—*Acrid milky juice.* Purgative. Used also for lining cloaks, named after Euphorbus, physician to a king of Mauritania, who first used them in medicine. Some of them thorny. About 2,500 species. Stamens and pistils not on the same flower; fruit ordinarily splits into three divisions when ripe; succulent stems.

Nabári (Cicca disticha).—*Indian cherry.* Leaves sudorific; seeds purgative; fruit eaten as pickles or preserves.
Samak. amalaka. the my-nobalan. *Amlá (Embllica officinalis).*—Leaves bifarious, i. e., placed in two rows; flowers in the beginning of the hot season; fruit ripe in eight or nine months after; bark used to cure diarrhœa and tan leather; fruit pickled; wood durable under water.

Shádá hájár Mani (Phyllanthus Niruri).—Fresh root astringent; a good remedy in jaundice. Leaves diuretic. In some of the species the flowers grow on the leaves.

Pánsioli (Phyllanthus multiflorus).—A climber. Juice used in ear-ache.

Khudiokrah (Crotophora plicata).—Seen on rice fields at the end of the cold season. Cloth, moistened with the juice of the green capsules, soon becomes blue, after exposure to the open air. Covered with white hairs, which gives it a hairy look.

tion to the condition of the roads, which for a long time have been unsafe.—*Bombay Gazette.*

MYRABOLAMS.—The season for the export of myrabolams generally begins about December, the exact time varying according to the past rainfall and the arrangements for the sale of forest produce. As a rule, a moderate quantity of new myrabolams is ready for export in December, and in January supplies begin to increase. During February, March, and April there is generally a good supply, and shipments continue pretty regularly until the end of the fair season. Throughout the monsoon, and till the next crop comes forward, small quantities of old berries reach Bombay and are gradually shipped. Bombay myrabolams are of three kinds, Bhiwudi, Vingorla, and Jabalpur. Bhiwudi myrabolams grow in the Tanna and Puna forests. Kalyan is now their chief market, but before railway times supplies came principally from Bhiwudi, and the myrabolams of the whole district are still called by that name. The time for new Bhiwudi myrabolams varies a good deal according to the rains and the forest arrangements, but they generally begin to be ready for export about December. As a rule, native dealers make contracts with the district forest officer for the right of picking myrabolams in Government forests, and with private owners of forests for similar rights in their land. These contractors have the berries picked in the forests, and, gathering them in villages, forward them to markets like Kalyan and a few other railway stations, from which they find their way to Bombay partly by rail and partly by boat. Vingorla myrabolams grow in the Kanara forests, and are forwarded to Bombay by boat from Kumta, Karwar, and Vingorla. In some seasons Vingorla myrabolams are earlier and in others later than Bhiwudi myrabolams. Free supplies of both come, as a rule, in January, February, and March. Formerly, Vingorla myrabolams were brought to market in the same way as Bhiwudi myrabolams. But of late the Government Forest Department has undertaken the picking, and at several local depots berries are now sold in large quantities. The trade continues in much the same hands as before. The native dealers who formerly contracted for the right to pick in the forests now buy the picked berries, and bring them to Bombay. Under this new system these myrabolams reach Bombay rather later than they used to, but when they begin they come in large quantities. Vingorla myrabolams cannot be forwarded during the rainy season, but they generally arrive in some quantity in October, when sea communication is reopened. Jabalpur myrabolams, from the Central Provinces and Berar forests, take their name from Jabalpur, the chief forwarding station. These myrabolams are later of coming than the other two kinds. They generally begin in February, arriving in large quantities in February, March, and April. During the rest of the year small supplies of Jabalpur and Bhiwudi myrabolams continue to come to Bombay. The trade of bringing myrabolams to Bombay for export is entirely in native hands, and the export business from Bombay is largely carried on by native merchants. A few European houses export myrabolams, but as a rule this business is not taken up by European exporters. Myrabolams are sent only to Great Britain, the chief ports for shipment being Liverpool, London, and Hull. According to the state of the myrabolam and freight markets they are sent either in sailing ships by the Cape or in steamers through the Canal.—*Times of India.*

A CURIOUS CUSTOM.—The custom among Brahmans, still acted up to, that under certain circumstances men must marry plants, is curious. If a Brahman is desirous of taking to himself a third wife, he goes through the marriage ceremony correctly, but abbreviated in details, with a *yekke gida* (*Aristolochia indica*). This is looked upon as the third marriage; after the ceremony has been completed the *yekke gida* is cut down and burnt. The man is now free, without fear of evil consequences, to wed the woman who is nominally his fourth wife. This custom owes its origin not to tree-worship, but to the belief that the number three is an unlucky one. By burning the third wife all bad luck is averted. It sometimes happens that the elder brother, not having come across a suitable wife, is still unmarried when the younger brother wishes to get married. Before the younger can do so, however, the elder goes through the ceremony of marriage with a plantain-tree, which is afterwards cut down, and the younger is then free to wed. The privileges of chewing betel-nut, wearing flowers in the hair, using sandalwood paste on the body, and tying up the cloth behind, in a particular manner, are confined to married men only. By going through the ceremony of marriage with a plantain-tree, the unfortunate bachelor who cannot get a wife is entitled to exercise all the vested privileges.

Jaypál (*Croton tiglium*).—*Croton oil plant*. A native of China and India. A very strong purgative; one grain is sufficient as a dose, and five hundred doses may be contained in a small wafer box, and purchased for half a rupee. Hence its Sanskrit names *jaypál*, nourisher of victory—*danti*, subduing seed. In the *Rasa Ratnākara*, one drop of the oil of the *jaypál* seed in betel-nut, is recommended as a ready purgative for princes. The seeds are convex on one side, bluntly angular on the other. The resemblance of some of them to a tick gave the name *croton*, so also of *ricinus*, as in the castor-oil plant. The lower flowers are female, the upper ones male and pale coloured. The leaves have a very nauseous taste.

Akkash (*Rottlera laccifera*).—A climber. Named from a Danish missionary in South India.

Bheránda (*Ricinus communis*).—*Castor-oil tree*.—Five seer of castor-oil nuts yield one quart of oil. The “gourd” under which Jonah sat near Nineveh was this tree, which was called by the monks, the great botanists of the middle ages, “*Palma Christi*”; they similarly gave to three hundred English plants religious names, such as “*Lady’s Slipper*,” “*Mary-gold*”; the Chinese use the oil for food, divesting it of its medical properties. The bark of the root is a powerful purgative. The tree often grows fifteen feet high, and thrives equally well on the burning plains and cold mountains of India. The stem is jointed, furrowed, of a heavy gray colour at the lower part, gradually acquiring a purplish hue towards the top; the calyx is reddish. The male and female flowers are placed on the same cluster; the male below, the female above. The leaves are shield-shaped, have the leaf-stalk fixed in their centre, instead of, as in other plants, on the margin, in divisions of from eight to twelve, of a bluish green colour, and are a favourite food of some silk-worms. The capsule contains three oblong flat seeds, which, when ripe, split through the middle cells. Seeds used to render colours

permanent. Sixty thousand maunds of castor-oil were exported from India to Great Britain and other parts of the world in one year during 1856-57. The name *Jatropha* signifies food and physic.

Bágh Bheranda (Jatropha curcas).—Angular leaved physic nut. The oil expressed from the seeds is used only by poor natives for lamps. The seeds are violent purgatives, hence its Bengali name signifies an oil fit only for tigers; it is used however externally in itch and pimples, as also a little diluted for chronic rheumatism. This oil, boiled with the oxide of iron, is used by the Chinese as a varnish for boxes. The milk juice dyes linen black, and is considered healing and cleansing. The leaves are five-angled, have a leaf-stalk five inches long; they are applied, warmed and rubbed, with castor-oil, to cause boils to break. On the Coromandel coast in fruit and flower all the year; wood useless, not even fit for burning. The trunk irregular, from being constantly kept low for hedges.

Akhrot (Aleurites triloba).—Indian walnut. Originally from the Malay countries; a native also of the Society Islands. The nuts are two, irregularly furrowed, have green veins; the kernels taste like fresh walnuts, and yield a pure palatable oil; in the Sandwich Islands they are employed for candles, 31½ gallons of the nut yield 10 gallons of oil. It is manufactured in Ceylon; the cake, after the expression of the oil, forms a good food for cattle, and also an useful manure. The seeds exude a gummy substance which the natives of Tahiti chew. The branches fall off soon, spread and ascend; the leaves are heart-shaped, the margins often scollop-toothed, when young covered with a down. The leaf-stalks have two hemispheric glands at their apex.

Svet basanta or mukut juri (Acalypha Indica).—A singular cup-shaped involucre surrounds the flowers. Botanic name means not beautiful to the touch, i. e., it stings. Leaf-stalks as long as the leaves. A decoction of the leaves is laxative,

rubbed on children's tongues excites vomiting. Cats are as much affected by the roots as by those of *Valerian*; bruised in hot water they are purgative. Sanskrit name *manshinká*.

Bichati (Tragia involucrata).—The hair stings like the common nettle. Its root used by Hindu doctors for an inflammatory state. Twining.

Batan or Huruya (Sapium Indicum).—Juices very poisonous; taste of the fruit excessively nauseous; seeds used to intoxicate fish.

Mom Chind or Cheldat pipul (Stillingia sebifera).—China vegetable tallow. In China candles are prepared from the fatty matter which envelopes the seeds, the oil used for lamps.

Sij (Euphorbia nivulia).—Common prickly pear. Stem irregularly angled like *phani manasá*; delights in a barren soil. The milky juice used as a purgative, and the pulp of the stem mixed with green ginger, is given to persons who have been bitten by mad dogs before the accession of hydrophobia.

Manasá Sij (Euphorbia ligularia).—Sacred to Manasá, the snake goddess; in July and August, on Tuesdays and Thursdays, the Natives approach the tree with offerings of rice, milk, and sugar, praying to be delivered from snake-bites; however they employ a surer means, by mixing the root with black pepper, as a remedy in bites. There is a festival, *Manasa panchami*, in honour of Manasá, who, while the Gods were sleeping, sat in the shape of a snake on a bunch of *snuhi*, to preserve mankind from the venom of snakes. The Native doctors purify arsenic, by making a hole in the green trunk of the *manasá*, filling it up with solid arsenic, and, after being covered with the bark of the same plant, the whole is exposed to a good fire, until the external parts of the trunk are completely charred, when the arsenic is taken out, and becomes fit for use. The leaves have the shape of a wedge, and are waved, have few veins, and fall off in the cold season, but appear again in April.

The branches are five-angled. The young shoots of the branches are spirally disposed, and armed with elevations like the teeth of the largest saw, each of these supports a leaf, and a pair of black stipular thorns. The juice is used to remove warts. The *Nára Sij* (*Euphorbia antiquorum*) has triangular branches, the juice mixed with *tíl* seeds used in rheumatism and constipation. Sanskrit name *bagra*.

Lanká Sij (*Euphorbia Tiraculli*).—Milk bush. In Madras called the milk hedge. The acrid juice used as a blister, and yet goats eat the plant with impunity. Sanskrit name *bagra tunda*. Germans called it the Malabar wolf's milk.

Chhota Kerui (*Euphorbia Chamæsyce*).—Branches spread flat on the ground: the *bara kerui* is hairy. There is also the *shvet kerui*, another species is the *chágál patapati*.

Rang Chitra (*Pedilanthus tithymaloides*).—Introduced into Bengal about 1790, juice used in wounds: employed for hedges, as neither cows nor goats will touch the leaves. The green leafless branches look somewhat like gigantic rushes.

62. URTICACEÆ.—*Nettle tribe*; includes plants very opposite in nature, such as fig, jack, nettle. No corolla; the stamens erect at first, spring back with elasticity to discharge the pollen.

Chundra Muli (*Urtica interrupta*).—Loves a shady situation. Stems streaked; roots spindle-shaped, eaten raw, boiled or roasted; leaves three nerved.

Lál Bichhati (*Urtica interrupta*).—The snakes of the vegetable kingdom. Hairs sting like the common nettles. At Chittagong is a nettle, *Urtica scabrella*, which though rough to the touch, does not sting. The Botanic Garden, Calcutta, has nettles from Chittagong, Rohilcund, Ceylon, Sumatra, Malabar, Circar Hills, Moluccas, Japan, Bareilly. In *Timor* is the *Urtica urentissima*, called the Devil's leaf, the pain from its sting lasts for years, and amputation of the limb is often necessary to avoid death, yet when dried, it is readily

eaten by sheep. The structure of the sting is like that of the rattle-snake's fang, each consisting of a tubular stilet perforated at or near the fine extremity, it widens at the lower end into a chamber at the bottom of which is seated a gland, which secretes an acrid juice, and when the finger presses the stilet its needle-like point enters the flesh, and the force required for this presses it down in the hollow chamber, so that the poison stored up there rises through the channel of the stilet, and is deposited beneath the cuticle. The tops of the English nettle are boiled and eaten. A decoction of nettles strongly salted coagulates milk readily. The roots boiled with alum will dye yarn of a yellow colour. In Siberia cords, cloth, and paper are made from the fibre of nettles.

Kunchura (*Urtica tenacissima*,) of the Eastern districts of Bengal, *Rheea* of Assam. By the exertions of the A. and H. Society of India, this plant has been proved to be identical with that yielding the fibre of which the "grass cloth" of China is manufactured. The *Kunchura* is probably, the strongest fibre with which we are acquainted, excelling Russian hemp in strength, and equalling Irish flax in fineness of texture.

Ganjā (*Cannabis sativa*).—*Hemp*. *Bhang*. Leaves added to tobacco, increase its intoxicating power, hence its Arabic name, signifying increase of pleasure, cementer of friendship, exciter of desire, leaf of delusion. The Hindus and Chinese, Turks and Hottentots, use it instead of spirits. The fibre being very tenacious, is used in commerce, particularly by Russia. The hemp plant destroys almost every other plant that grows in its neighbourhood. In Nepal, linen is made of it. It is used in medicine in cases of diarrhœa: this medicine is procured from a resinous juice on the plant. The *gunja* is the dried plant used for smoking; the *bhang* is the larger leaves, one pice worth suffices for intoxication.

Tut (*Morus Indica*).—*Mulberry*. Cultivated to feed silkworms, stripped of its leaves twice in the year for that

purpose. The inner bark used by Chinese for paper, and also for ghee. Sanskrit name *tula*.

Dumur (Ficus carica).—Leaves angular, lobate or palmate, three-nerved, rough above, downy below. The chief article of food near the Mediterranean, used also for poultices. In some climates it yields a treble crop. Sanskrit name *udeombar*. The *bhui dumur* is somewhat creeping. Thirty-four species in the Calcutta Botanic Garden. All plants of the genus *Ficus* make animal fibre tender.

Bat (Ficus Indica).—*Banyan tree*. Called by the Portuguese the rooting tree; its Sanskrit name is also *shiphá ruha*, fibrous-rooted. The branching roots are merely props to the heavy branches, they never produce a single branch or leaf; in Kumaon, the mountaineers use the elastic fibrous roots for poles on the mountains, but they are not cut till the supposed indwelling arborescent god is appeased by the sacrifice of a goat. The fruit is of a pale red colour: the seeds are used by the Tamuls as cooling and tonic. The white glutinous juice, which issues when the stalks are bruised, is used for tooth-ache, also for cracked feet, and bird-lime, and has some of the properties of India-rubber. The bark is used as a tonic. One near the Nerbudda was so branchy that 7,000 persons sat under its shade; it had 350 trunks, and was 2,000 feet in circumference. On Vaisaki 16th, *Savitri britanta*, is a fast observed with ceremonies by Indian women at the root of this tree, to preserve them from widowhood. Milton's famous lines are beautifully descriptive:—

Branching so broad and long, that in the ground
The bended twigs take root, and daughters grow
About the mother tree, a pillared shade
High overarched with echoing walks between.

The one in the Calcutta Botanic Garden is 550 in circumference. Birds sometimes drop the seeds of the *bat* in the Palmyra tree, the *bat* spreads till it covers all the Palmyra

except the top. The Hindus say this is a holy marriage instituted by God.

Káshmir (Ficus elastica).—Indian-rubber tree.—A native of Sylhet. Stipules nearly as long as the leaves, which are highly polished on both sides. The caoutchouc which comes from this tree, was discovered accidentally by Dr. Roxburgh in 1810. The natives of the Jaynti Hills have for ages used the juice for lining baskets, and for candles.

Pipul or Aswath (Ficus religiosa).—The Indian aspen leaf, its tremulous motion is owing to its long leaf-stalk, which is twisted by the weight of the leaf when acted on by the wind. It is sacred to the god Vishnu, who was born under its branches, hence the cutting it is counted an unpardonable sin, not to be atoned for even by sacrifice, fortunately the wood is useless, so there is little temptation. The Buddhists regard it as their holiest tree, and say that the egg-shaped leaves, suddenly tapering to a point, always tremble out of respect to Gotam, who sat under its branches. On the fleshy part of the leaf being removed, and the skeleton varnished, most beautiful drawings of insects, birds, and flowers, are made by the Chinese. In Candy the form of its leaves was allowed to be painted only on furniture employed exclusively for the king's use. Bird-lime is made from the juice of the stem; the leaves of this, as well as of the castor-oil plant, are given for feeding silk-producing worms, this is one cause of the strong wiry nature of Indian silk. The lac insect delights on its twigs. The fruit comes out on the branches. Its Sanskrit names are *chaladala*, quivering branches—*pippala*, the preserver—*kungarasan*, elephant's food—*ashwattha* not durable. The trunk, when old, has many ridges and hollows, as if many trunks were united; the bark is deemed a good tonic.

Gayaswath (Ficus cordifolia).—Fruit black perfectly round; leaves narrower, and with points much shorter than in the aswath.

Pákur (Ficus infectoria).—Noted for its branching roots and beautiful head; bark very tough; stipules grooved with a coloured gland round their apices; fruit the size of a pea, when ripe, white.

Yagya Dumur (Ficus glomerata).—A tree loving water courses. The under side of the leaves taper equally towards each end, covered with minute green dots; leaf-stalks channelled; bark rough; fruit eaten by the natives. There is also the *kák dumur*, whose leaves are net-shaped, and beautiful; yields an abundance of milk juice.

Kántál (Artocarpus integrifolius).—*Jack*. Noted for its fruit, seventy or eighty pounds in weight, formerly a favorite with Europeans in India, though the scent is unpleasant. The yellow viscid, milky juice furnishes bird-lime. Its dark-green shining leaves and deep shade render it useful as a shelter. The wood, of a handsome yellow orange tinge, is used for furniture. Root, bark, wood yield a yellow dye. The finest fruits sometimes grow on the roots, when the tree gets old, but when middle-aged from the trunk, and will be found by observing the cracking of the earth above them; the fruit issues direct from the stem. In Ceylon, the trunk is sometimes twenty feet in circumference. The stamens grow on a sort of long cluster, the pistils on a round one. Sanskrit name *punasi*. The *Artocarpus incisa* (*bread-fruit tree*) grows near Bombay, its leaves are notched.

Deophal (Artocarpus lacorcha).—The fruit is eaten when unripe, contains much milky juice; roots give a yellow dye; bark very rough; the leaves have a beautiful net-work between the parallel veins.

Sheorá (Trophis aspera).—Milky juice applied by natives to sores and sand-cracks in the feet. Leaves used to polish ivory; and also for fuel. Berries greedily eaten by birds.

61. PIPERACEÆ.—*Pepper tribe*. Creepers. Burning taste, but aromatic smell. Several hundred species, but only two genera. 54,000,000 lbs. of pepper produced annually.

Pippul (*Piper longum*).—Made from the dried fruiting spikes when unripe. A native of the Circar mountains. Sanskrit names *videhi chapala*, *ushana*. There is also the *choi* or *piperchaba*, Sanskrit name *chavi*.

Pán (*Piper betel*).—A native of the Indian Archipelago. Chewed with lime it is used for its intoxicating power, for allaying the calls of hunger, and for sweetening the teeth. Sanskrit names *nágaváli tambulavali*.

62. SALICACEÆ.—*Willows*. Bark astringent, used in tanning and fevers. 200 species known; only one in India. Wood very good for charcoal.

Páni Jumá or *Báisi* (*Salix tentrasperma*).—The leaves are green above, hoary below. The bark gives a tonic substance.

ENDOGENS OR INWARD GROWERS.

Have one seed lobe. Harder outside than inside. Leaf veins not net-shaped.

About 50,000 species known. Parts of the flower arranged in threes.

63. HYDROCHARACEÆ, or *Frog Bit Tribe*.—Floating plants in fresh water; flowers with a spathe, or cover, when young. These plants live under the water, except just at the time of fertilisation, when the flowers rise for a few hours above the surface.

Rasanjághi (*Vallisneria alternifolia*).—Grows in rivers and rapid streams where the level is not always the same. In order to enable the pistilline flowers to keep on the surface of the water, which is necessary for the fertilisation of the seed, they are made lighter than the water, and are mounted on long corkscrew-like stalks, which, by their elasticity, extend as a spiral spring when the surface of the water rises, and contract when the water sinks. When their pollen is mature, and the anthers are ready to burst, the flowers producing it detach themselves, rising by their lightness to the surface, and

discharge their pollen; when the seeds are ripened, the spiral flower-stalk again contracts, and carrying down the dry fruit, buries it in the mud.*

Patá shyeáílá (Blyxa octandra).—Leaves sword-shaped. Used for supplying water mechanically to sugar in the process of refining it, as clay is used in the West Indies to permit the slow percolation of water. Its stamens have the same property as the last named plant, and hence its Sanskrit name *shaiivál*, “the sleeper on the water.”

Páni kalá (Ottelea alismoides).—The seeds are affixed to six sharp keels running on the inside of the joinings of the valves.

64. *ALISMACEÆ, or Water Plantain Tribe.*—Aquatics. Seeds hooked: embryo of a horse-shoe shape. Many have a fleshy rooting stem, which is eatable.

Chota hat (Sagittaria sagittifolia)—Flowers in spring. Leaves arrow-shaped. In China cultivated for its roots, which are eaten. The root is composed of many fibres, from a crown formed by the united leaves, the centre one thicker, and ending in the half putrid remains of the small round bulb which gives existence to the plant, while from its sides many suckers run a few inches, each ending in a small round bulb, which in due time produce other plants.

Bara hat (Sagittaria obtusifolia).—The seed is bent double, with the two extremities pointing to the base, by one of which it is fastened to the bottom of the fleshy fruit. Various Brazilian plants of this *sagittaria* genus yield, from their astringency, a juice employed in making ink.

65. *LEMNACEÆ, or Duckweed Tribe.*—Floating plants. Composed of a little green scale, which looks like a leaf; from its under side hangs down a single root fibre. The leaves have acrid properties.

* Darwin has made this a poetic subject in his “Loves of the Plants.”

Tákápáná (*Pistia stratiotes*).—Two other species in Bengal, well known by the appearance of a green scum they give the water. The leaves are made by Hindus into a poultice for piles, and a decoction of them is used for their cooling properties, and in cases of a difficulty in passing of urine. The leaves float on the water, absorb a great quantity of the noxious vapours as fast as they are exhaled, and change them by the aid of the sun's rays into respirable air. This change is effected by the *pistia* more than by any other plant: it is so powerful a preventative of decomposition in stagnant water, that fishes are preserved alive in water in which otherwise they would not live: this is particularly the case in Batavia. Sir C. Napier, inspecting the lines of a native regiment in the Punjab, observed coolies drawing water from a tank covered with a slimy and greenish weed, the *pistia*; he ordered it should be immediately cleaned, so it was,—but it was not until a fresh crop of weed had grown that the water became drinkable.

66. ORCHIDACEÆ.—Called Epiphytes, but by the Hindus by a simple name “sons of trees.” Of 1900 species, only two are known in Bengal, though very numerous in Assam.* Their flowers are so curious in their shape that there is scarcely a common insect, or snake, or monkey, to which some of them have not been compared.

Svet Huli (*Zeuxina sulcata*).—Found in pasture ground near Calcutta at the close of the cold season, the three upper petals of the corolla are helmet-shaped.

Budbari (*Eulophia virens*).—Flowers in the cold season; bulbs conical, flowers streaked.

* A gentleman from Assam, Capt. Lowther, has promised to furnish the Agri-Horticultural Society with a list of Assam plants on the plan of the present one. We trust he will give a full account of Assam orchids with the native names of all the plants.

67. ZINGIBERACEÆ, or *Ginger Tribe*.—The shape of their roots has given them the Sanskrit name *shringāvera*, i. e., “root horn-shaped.”

Adā (*Zingiber officinale*).—The seeds are seldom met with, on account of the great increase of the roots, which are biennial. Used by the natives in cases of paralysis, rheumatism, and intermittent fever; in the Dacca district ginger yields eight to ten maunds per biggah. The natives cleanse the roots in boiling lime water, which probably injures much of the fragrant pungency: whereas in the West Indies they use simply cold water. Nearly 90,000 cwt. of ginger was imported from the East and West Indies into England in 1852.

Bach (*Zingiber zerumbet*).—Broad-leaved ginger. Leaves and shoots used as greens. Grows wild in the Concan.

Huldi (*Curcuma longa*).—Turmeric. From the dry root, powdered, and mixed with powdered wood of *Cæsalpinia sappan* is obtained the red powder used by the Hindus in the Huli games, hence probably its Sanskrit name *yoshitpriyā*, “beloved by women.” The Javanese apply its nuts pounded and made into an ointment to cure skin diseases, while the Hindus use it in bruises and leech bites, in cleansing ulcers, in diarrhoea and for worms, hence its Sanskrit name *krimigna*, “the worm-killer.” It is used for seasoning dishes, and as a dye, but the colour does not last. It yields from 60 to 300 maunds per biggah.

Ban huldi (*Curcuma aromatica*).—The flower often appears before the leaf.

Kāla huldi (*Curcuma cæsia*).—The leaves have down their middle a deep ferruginous purple cloud. The roots of another species, the *rubescens*, yield a starch like arrow-root. In Travancore it forms a large part of the diet of the inhabitants; it has never been tried much in Bengal.

Chandra mula (*Kampfæra gulanja*).—The flowers have a purple speck on the centre of the division of the inner border. Leaves spread flat on the surface of the ground. The

roots are valued as a perfume and medicine, hence probably its Sanskrit name *chandramuliká*, "moon root."

Bhui champa (*Kæmpferia rotunda*).—The beauty of its flowers, which blow only for a day, and its having no stem, gave it its Sanskrit name, "the champa of the earth." If at the flowering time there are no leaves on the plant, the envelope of its flower is shaped like the tiles of a house.

Madan nirbishi (*Kæmpferia angustifolia*).—The natives give the root as medicine to their cattle:

Dulál champa (*Hedychium coronareum*).—Throws out a profusion of large beautiful fragrant blossoms for a long time.

Tárá (*Alpinia galanga*).—Root biennial or perennial, the stem is entirely covered with the sheath of the leaves; flower a beautiful rose colour, but no scent, though the root is aromatic. The juice of the root is used as a remedy in hæmorrhoids. Near Dacca they make twine and rope from the plant.

Keo (*Costus speciosus*).—A preserve is made by the natives from its root; though the fresh roots are almost insipid. The plant is a handsome one, with soft velvety leaves spirally arranged.

68. CANNACEÆ, or *Arrow-root Tribe*.—Starchy roots, reed-like plants, with beautiful flowers.

Mukta páti (*Maranta dichotoma*).—Mats are made from the split stem, which is hence called *shital páti*, or "the cooling reeds." A tough fibre is obtained from this.

Sarbajay (*Canna Indica*).—There are two species, the red and white: the former used by the Burmese for sacred beads, and by Hindus for necklaces. It is called Indian shot, because its seeds are shot-shaped; they are used as a substitute for coffee, and yield a purple dye. A watery secretion takes place from the points of the ribs, which terminate at the margin of the leaves. The leaves are used to thatch houses with in Cayenne. Nearly all the species contain starch in the root-stock, which renders them fit for food after being cooked. The root, boiled in rice water with pepper, is given sometimes to cattle whose

belly is swollen from having eaten some poisonous grass. It is in flower and seed most part of the year.

69. *MUSACEÆ*, or *Plantain Tribe*.—Flowers on spikes. Curved leaf veins. No proper stem, as the leaves are sheathing encircling each other, and enveloping layer within layer the flower and fruit stalk. The *rám kalá*, or wild plantain, ripens its seeds six months after blossoming, the plant then perishes down to the root.

Kalá (*Musa Paridisiaca*).—The fruit has no acid, hence it is good for bilious persons. The banana is like it, but its stalk is marked with purple spots, and the fruit is shorter and rounder. Its fibrous bark is made into cloth and cables. The leaves were said to be like Ostrich feathers, as they form no network, and easily split. There are twenty varieties of plantain in Tenasserim, ten in Ceylon, and thirty in Burmah.

From Asia it has been introduced into the West Indies and South America; and into England in 1680. It is more productive than wheat. In South America the fruit is dried and preserved, while the flower is separated and made into biscuits. The fruit can keep for twenty years, owing to the sugar in it. 100 parts of the recent fruit contain 27 of dry nutritive matter—the potato gives 25. In the plantain fruit out of 100 parts there are of water 14, starch $67\frac{1}{2}$, gum $4\frac{1}{2}$, cellular fibre $4\frac{3}{4}$, sugar 2, oil $\frac{1}{2}$, albumen $4\frac{1}{2}$, ash $2\frac{1}{2}$. A sucker attains maturity in a year, each produces fruit weighing from 25 to 90 lbs. In the West Indies the spiral vessels of the flower-stalk are used as tinder. One tree gives 4lb of fibre; 600lb weight of fibre might be produced annually from each acre of plantains. The plantain is used as a nurse or shade to the betel, vine, or areca. The top of the stem yields a juice good for making ink. The fibre can furnish material for paper and canvass, thus the plantain gives food for body and mind. The Chinese use the young shoots for paper-making. Called in Sanskrit *báranballabhá*, “pleasing to the elephant.”

The plantain flowers all the year, but especially in the rains. Roxburgh.

The plantain has many *spiral vessels*, *i. e.*, membranous tubes in the conical extremities, the inside being occupied by a fibre which uncoils itself elastically; this may be spun into thread.

Jagynavalkeas, the great Hindu legislator, in the 3rd book, 8th section, compares human life to the plantain tree without pith, *i. e.* empty and vain. Its long leaves 7 feet, with their parallel veins at right angles to the mid rib, led to its being compared by the ancients to ostrich's feathers, and to the Sanskrit name *ācyathchadā*. Its spike often has fruit weighing 40lbs. Its Latin name was given it on the supposition that it was the forbidden fruit Adam eat. 1607 square feet of ground yield 4000lbs of nutritive substance from plantain, which will support 50 persons, the same space planted with wheat will support only two. It is in season all the year round. The Dacca plantain is nine inches long, in Madagascar the plantains are as large as a man's forearm. In the mountains of the Phillippine Isles a single fruit or two is said to be a load for man. All the large ones require, like potatoes, to be roasted. Valuable cordage, in large quantities, is made from the plantain stem in Manilla, and extensively exported. Hemp, and the finest flax can be made from its fibres and tissues, almost as fine as those from the fibres of the *ananas*. The fruit dried in the sun keeps perfectly a length of time, and resembles a rich fig. Twelve months after planting, 70lbs of fruit are often obtained from a single plant. The south of Spain is the only part of Europe in which the banana is cultivated in the open air. The *veins* diverge from the mid-rib along its whole length, and lose themselves in the margin.

A curious mistake is made in *Loudon's Encyclopedia of Plants* respecting the plantain, he writes "three dozen of plantains are sufficient to serve one man for a week, instead of bread, and will support him much better."—We can only say we should be sorry to be that man.

70. AMARYLLACEÆ.—Bulbous-rooted. One of the few exogen orders in which poison is found. The Agave so useful for its fibre, for hedges, soap, sugar, wine and paper, belongs to this order.

Baru káhar (*Crinum Asiaticum*).—Under side of the leaves elegantly striped, bruised and mixed with castor-oil they are used in inflammations; in the N. W. P. they give the juice of the leaves for ear-ache. The root is used as an emetic in Java, and is considered by Dr. O' Shaughnessy, to be equal to Ipecacuanha.

Sukh darshan (*Crinum deflexum*).—Flower fragrant at night.

Biláti anannas (*Fourcroya cantala*).—Flowers when 12 years old.

71. DIOSCOREÆ, or *Yam tribe*.—So called from Dioscorus, the most ancient writer in materia medica, 1800 years ago. Tuberous roots: leaves with net-shaped veins; twining. The various kinds are distinguished by the shape and colour of the roots. The West Indies is their favourite country; they are there what the potato is in Ireland; raw they have an acrid principle. Though in such use among natives, none have a Sanskrit name, and are not indigenous.

Chupri álu (*Dioscorea globosa*).—The favorite yam among natives. Stems have six wings, with the angles. Membrane winged, and prickly towards the root.

Khám Alu (*Dioscorea alata*) square stems.

Rakta garániya álu (*Dioscorea purpurea*).—When the roots are more than one year old, the lower permanent parts of the stems are generally armed with prickles.

Gorániya álu (*Dioscorea rubella*).—Flowers very fragrant.

Man álu (*Dioscorea aculeata*).—Called in Bombay the Goa potato: root two lbs. weight.

Susni álu (*Dioscorea fasciculata*).—Natives extract starch from the roots. Has several stems.

Kukur álu (*Dioscorea anguina*).—Tubers columnar, perpendicular in a loose soil, but variously bent in a hard one.

Shir álú (*Dioscorea nummularia*).—Stem many fathoms long: lower part prickly.

Kántá álú (*Dioscorea pentaphylla*).—Not cultivated in Bengal, but very much so in Amboyna.

72. BROMELIACEÆ, or Pine Apple Tribe.

Anannas (*Anannás sativus*).—An American plant; its name is of Brazilian origin, the name *pomme de pin*, “pine-apple,” was given it by the Spaniards from the supposed resemblance of its fruit in shape to some pine cones. It was unknown to the Arabs, Greeks, or Romans. Cloth as fine as muslin is made from the fibres of the leaves.

A pleasant wine is made in Jamaica from its fruit. The best in the world are the Bengal: It was introduced into Bengal in the reign of Akbar by the Portuguese, who brought it from Malacca. In Mexico they are commonly suspended to the balconies for the sake of filling the house with their delightful fragrance, as they can subsist for a long time on the fluids they contain, or on the moisture they absorb from the atmosphere. The fruit consists of numerous concrete ovaria, with the adherent perianths become succulent. The unripe juice has caustic properties, and can corrode a knife.

It is propagated by suckers, from the tuft of leaves at the top, a continuation of the axis. In Tenasserim a boat-load is sometimes sold for one rupee.

Discovered in America in 1513, in 1594 it was cultivated in China, the fruit was first brought from Santa Cruz to the West Indies then to China; and at a subsequent period to Bengal in the East Indies. Introduced into England in 1690 from Leyden; the English fruit equals the tropical, and is called the “queen of fruits.” 50 varieties cultivated in England in stove hot-houses. In Italy it does not thrive, as the leaves are so porous, and the climate so dry, that it shrinks up. The Society Islanders call it the white-man’s *pandanus*, because its foliage, and mature fruit, are like those of the *pandanus*.

It is called by natives *kutl suffree*, or "the jack for a journey," as its fruit ripens even when carried about.

73. SMILACEÆ, or *Sarsaparilla* Tribe.—Climbers.

Kumáriká (*Smilax ovilifolia*).—Armed with strong prickles. Considered to have all the properties of sarsaparilla. Root mixed with cucumber, ginger and oil is used in head-aches.

74. PONTEDERIACEÆ.—Aquatics; blue flowers.

Nauká (*Pontedera vaginalis*).—Its Sanscrit name, *nilutpal*, "the blue lotus," denotes the qualities of all of this order. Three other species in Bengal. The root masticated is considered a remedy in tooth-ache: its bark pulverised along with sugar is eaten for asthma. *Pontederia hastata* common.

75. LILIACEÆ.—Bulbous roots. Beautiful flowers, used among natives as the symbols of purity and modesty.

Rajani gandha (*Polianthes tuberosa*).—The Malays call it "the mistress of the night," as at night it scents the strongest; a great favourite in Cochin-China; it has been observed after thunder to emit sparks of a bright flame from those flowers that were fading.

Murba (*Sanseveria Roxburghiana*).—Bowstring hemp. Its fibres silky, but strong, called China grass, very valuable for rope or paper. The ancient Hindus used a thread extracted from its leaves to make the *paita* of the Khetry class.

Grita kumári (*Aloe Indica*).—This may thrive in poor soils, as, in common with the aloe tribe, it draws its chief nourishment from the air; the fibres are valuable. An ink is prepared by Muhammedans from the juice of the pulp; this juice also used for sore eyes.

Rasun (*Allium sativum*).—Garlic. The expressed oil is used by the native doctors in rheumatism, in asthma, cough, and for promoting digestion, particularly among vegetarians. The author of "*Talif Sherif*" has employed its sherbet with much effect in cases of paralysis.

Gandan (*Allium ascaloneum*).—Schallot. Stem flat-leaved. Stamens three-pointed.

Peyáj (*Allium cepa*).—Onion. Came originally from Egypt. Used by natives for hæmorrhoids, and baldness. Its Sanskrit name *latárka*, "sun-creeper," denotes the value set on it.

Hilluá (*Asparagus officinalis*).—Asparagus. Leaves bristly.

Shatamuli (*Asparagus racemosus*).—Root very fragrant; has many tubers; boiled in milk it is given in bilious disorders, but the bark must be removed, as it is poisonous. The leaves boiled and mixed with ghee are applied as a poultice to boils.

76. COMMELYNACEÆ.—Spider worts. The fleshy roots of some contain starch, which when, cooked, are fit for food. The Chinese use some of them for coughs, asthma, &c.

Páni kánkra (*Commelina salicifolia*).—Flowers deep azure.

Kánkra (*Commelina Bengulensis*).—Flowers blue.

Jatá kánkra (*Commelina communis*).—Flowers a bright blue.

Kándali (*Aneilema nudiflorum*).—Flowers small and blue.

77. PALMACEÆ, or *Palm Tribe*.—Called by Linnæus in modern times, and by Amer Sing in Hindu times, "kings of the grasses." They vary much, some are 5 feet long, some 500; out of 1000 species ascertained, very few are known in India. South America seems to be their favorite locality. They are of all orders, the most useful for economical purposes, food, building, clothes, lights, &c.

Supari or *Guyá* (*Areca catechu*).—Betel. There are 20 different species, one of these, the *Rámguya*, is found at Chittagong. It is a social plant, growing in groups marked by their beautiful appearance, hence likened by an Indian poet to an arrow shot from heaven. This palm often grows 50 feet high, with a diameter of 2 feet, has no branches; its leaves are very beautiful, forming a round tuft at the top of the trunk, which is usually about 6 or 8 inches in diameter, straight, round, and marked with parallel rings. The leaves which are feathery, spring forth in pairs, that alternately

cover each other, encircling the top of the trunk, and thus producing an oblong head larger than the trunk itself; they are not more in number than six or seven feet long, on a stalk 4 feet in length. These leaves break and fall off in succession, and from their axils issue the sheath which enclose the flowers and fruits. The fruit is called a *drupe*, about the size of a pullet's egg, and does not fall from the tree even when ripe, it has a yellowish shell, thin, with arched veins cohering with the pulp all round. In Johanna, the nut is used for dying cotton red, or making ink. On the Coromandel Coast 300 nuts on an average grow on one tree. A cargo of betel nuts generates so much heat that the crew cannot sleep between decks. A good tooth-powder is made from the nuts. In the Cossyah country the natives measure distances by the number of mouths of betel-nut chewed on the road.

Bet (Calamus Rotang).—Ratan. More than 4,000,000 are shipped annually from India. Delights in a rich moist soil, where there are bushes and trees for it to climb on: Fl. R.S. Fr. C.S. Climbing to a vast extent, enveloped in the thorny sheaths of the leaves. *Leaves* feathery, eighteen to thirty-six inches long. *Leaflets* armed on their margins with minute bristles pointing forward, and a few erect distinct long bristles on the upper surface. *Sheaths* armed with numerous compressed thorns: *Leafstalks* channelled, having straight and recurved thorns on the under side. *Flagelli* one from the sheath of each leaf near its mouth, like the lash of a whip; A bridge eighty feet in length has been constructed in the Himalayas entirely of ratan. The shape and flinty secretion of this gives it an affinity in some points more with the bambu grasses than with the palms.

Tál (Borassus flabelliformis).—Palm tree. In the Madras Presidency a caste called *shanars* draw the toddy or juice from it. The tree lives to a great age: the wood is harder at the bottom than at any other part of the stem. The

diameter of the stem differs very little in size when the tree is young; in consequence of this, and of its cylindrical form, the palm is never strangled by creepers, as many exogens are, the bambu however when old, increases in diameter from half an inch to two feet; some *palm* trees bulge out in the middle, and then contract again.

The number of external rings which indicate the fall of leaves from the trunk of palm trees, is supposed by some to coincide with the number of years the tree has lived. The leaves are palmate, plaited, and cowed: stalks serrate, near six feet long, flat, a little hollow and rough, with spines along the edges. The fruit varies in size from a small orange to that of a child's head. In Celebes it is called *tal*. Its Sanskrit names are *kasapatrabân*, "with saw-leaves,"—*tantaniryas*, "thready exudation,"—*trinadrum* "the grass-tree.

The veins are straight, arising from towards the base of the mid-rib, with which they lie nearly parallel. 100 can be planted in one beegah, and they fertilise the ground, for the grooves of the leafstalks, and the leaves, are well adapted for conveying rain water. The top of this tree is often seen issuing from the stem of a banyan, owing to the birds dropping seeds on the palm tree, which germinate. A native work gives 801 uses of this palm; the natives apply the sap of the root and trunk to cure sores, and in cases of dysentery. A flour is made in Ceylon from the seeds.

Târá (Corypha taliera).—The leaves are palmate, pinna-tifid, sub-rotund, plaited; the inflorescence is shaped like a pyramid: it flowers in March, and the seeds ripen ten months afterwards. Trunk about 30 feet high. Leaves used to write on with pointed steel bodkins, and for the rafters of houses. Leafstalks from 5 to 10 feet long.

Bajur (Corypha elata).—Flowers in March, but seeds require twelve months to ripen.

Khajur (Phoenix sylvestris).—Wild date. Its Sanskrit name is *madhukshir*, or "honey-milk."

The *Phoenix dactylifera*, the chief food of the Egyptians, gave its name to Phœnecia. There are 46 varieties of it in Sahara, and almost all the population of Fezzan live on the palm dates for 9 months of the year. It bears from its 10th to its 35th year. Each tree yields about 180 pints of juice: Every twelve pints give by boiling 1lb of goor, yield 7lbs of sugar. A single spathe contains about 12,000 male flowers; but this tree does not thrive in Bengal, owing to the heavy rains.

Hintál (*Phoenix paludosa*).—The trunks of the smaller ones are used by the natives as walking sticks; they think when provided with such a staff that snakes will get out of their way.

Nárikel (*Cocos-nucifera*).—Cocoa-nut. The liquor toddy is obtained by wounding the spathe of this tree, which is two feet long; a cup-full in the morning is good for constipation, and purifies the blood; in the day time the heat ferments it; an inferior sugar is also made from it. The liquor in the growing cocoa-nut is a refreshing drink. By scraping down the ripe kernel of the cocoa-nut, and adding a little water to it, a white fluid is obtained by pressure, which may be used as a substitute for milk. The oil is used for the hair, for burning, and, in England, for soap and candles. At the top the germ of the new growth yields a substance which is a substitute for cabbage. Vinegar is procured from toddy. On the outside of the lower part of the branches, where they spring from the stem, and are partially covered with the coarse vegetable matting of the tree, is a soft, downy, light brown coloured cotton. It is used for stanching blood. The Hindus say Visamitra created it in his progress to make a human being, in rivalry of Brahma, the nut being the first rudiment of the head, and that the eyes can be seen. It is not a native of America. On Ceylon, along the coast between Colombo and Matura, for 100 miles, there is nothing but one cocoa-nut garden. On the shores of the Gulf of Curicao

there are groves of 9,000 plants. One of the nineteen Hindu castes, the Shanar, is exclusively devoted to the cultivation of the cocoa-nut: which is deified by Hindus. The winged leaves extend in a graceful curve. Leaves eighteen feet long, twelve in number, radiate as spokes. The mid-rib is ten inches in circumference: the flowers, enclosed in a sheath. The *roots* are not wide-spreading, hence it is planted near Hindu houses, and its shade nourishes a good grass. A bird builds its nest at the extremity of its leaves. It has patrician rank among the palms, rising with one foot diameter to eighty feet, marked with circular rings, and a fibrous bark near the root. The male and female *flowers* grow on the same stalk. In the lower part of the shell is a hole through which the germ issues. The closed bud, flowers, tender drupe, immature nut, in all the different stages of progress, at the same time appear on one tree. The Coromandel cocoa-nut is a reddish yellow colour, hence called the Brahminical nut. The Canarese husk is green. The Malabar has its fruit turbinated. The sea air is necessary for it, even sea water does not rot the roots. Lives to 80 years, gives fruit from 40 to 50; after 60 declines. Should it lose its head, its roots cease to acquire nourishment. The seed is sown in the husk; after 18 days the germ comes up: one month after sowing the root is strong enough to burst the shell; the roots are very deep, hence little affected by storms. Salt is put at the bottom of the holes. In Ceylon the trees bend towards the sea. The fibrous net-work stem is so elastic as to cause a cannon-ball to rebound from it. The sugar or jaggry from it makes a very strong cement; 3 million pounds of coir were formerly made by the Dutch in Ceylon. In South America each tree yield a 100 nuts. The cocoa-nut flower looks, when closed, like a pod, but when cut open, the most beautiful wax-like flowers burst out of it. The cocoa-nut is so common in this country, that many pass it by without noticing the peculiarities of its

structure, and its adaptation to the country. We give an extract on this subject from *Archer's Economic Botany*, p. 69.*

78. *PANDANEACEÆ*.—Screw Pines. This order seems a compound of grasses and palms. The spongiolets of the aerial roots are composed of numerous very thin exfoliations, forming a sort of cup to hold water for the supply of the roots. The stem next the ground is very slender; higher up it is thicker, and sends out aerial roots, which seek the soil and act as stays upon the centre. The leaves are arranged like a corkscrew, numerous crystals of lime are found in the seed-shell.

Keyá (*Pandanus odoratissimus*).—In the Mauritius matting and packing bags are made from its leaves. In Cochin-China hedges are made with it, and its leaves are used for feeding tame elephants. Its flower is a great favorite with the Burmese. The stem is dichotomous, or having the divisions in pairs. The terminal leaf-buds constantly develope.

* The peculiar triangular form of the cocoa-nut has been pointed out as a special provision for its dissemination; thus, growing as it does frequently near the shores of the sea and rivers, its large seeds drop in the water and their shape particularly adapts them for sailing: one edge being downwards forms the keel while the upper surface, being flat, is acted upon by the wind, and propelled by it along the surface, until it reaches some coral reef, or shore where, being stranded, it vegetates and rises to be a magnificent palm, affording shelter and food in abundance. The coir and husk too, assist in this economy of nature: as the exposure to moisture, and the heat of the sun, are conducive to vegetation, and as the salt water would destroy the young plant if its tender shoot and home should be pushed out into the sea, a curious arrangement takes place, as soon as the shoot and root push out from the foramen, they take a direction towards the other end of the nut through the mass of coir fibre; this gives an increased weight to that side of the nut, which acts as ballast, keeping it downwards and under water. The coolness to which the shoot is thus exposed assists in keeping the vegetative power in check; but no sooner has it landed upon some congenial soil, than it throws out its strong roots, and soon renders a barren island fertile and verdant.—*Archer's Economy of Botany*.

The *Pandanus odoratissimus*, is famous among Sanskrit poets for its fragrance, and is found every where in Arabia and China. The terminal bud is eaten as cabbage. Umbrellas are made of the leaves in South India: and in the South Seas, mats, cordage and hutting.

From the *Pandanus odoratissimus* is prepared a distilled water, gently stimulant, and promoting perspiration. Snakes are very fond of lurking in this plant.

Keya Kántú (*Pandanus fœtidus*).—The smell of the flower is very offensive. Such an abundance of crystals of lime are in the seed-coats of this family as to be seen with the naked eye. In Burmah a species grows near tide-waters, very useful for making mats.

79. TYPHACEÆ.—Bulrushes. Ditch growers, bear a close resemblance both to sedges and screw-pines.

Rám Hoglá (*Typha angustifolia*).—Leaves used for mats.

Hogla (*Typha elephantina*).—Elephant grass. A diminutive species of screw-pine. Used on the banks of the Indus to bind the soil together, and also as buoys to swim with. Fl. R. S. Grows in stagnant water. *Roots* stoloniferous, abound in starch, employed in the East of Asia in dysentery and measles. *Culms* glossy, pointed at the insertion of the leaves. *Leaves* sword-form, below, near the sheath, a little convex on the outside, concave within; used for thatch; no *corolla*. *Seed* oblong, carried about by the wind like the seed of the thistle, by means of the permanent downy fusi-form calyx. Elephants fond of it. *Anthems* wedge-shaped. *Pollen* mixed with water forms a kind of bread in Scinde, Western Australia, and New Zealand, as also in Bengal; it is inflammable like that of *Lycopodium*.

80. AROIDEÆ.—Have no floral envelopes. In cold climates many are herbs which become trees in the tropics; many of them, when raw, have an acrid juice. Some of them in germinating give out a sensible quantity of heat, while

the emanations produce dizziness, head-ache and vomiting. The structure of their flowers is worth observing.

Mán kachu (*Colocasia Indica*).—A favorite in Indian curries. The root is used for swellings of the abdomen; reference made to its properties in the Vaidea work "*Drabea Gun*." A variety of it, the *mán giri*, has the leaf-stalks of a darker colour; in Kartik month the natives in East Bengal worship Kalmi, Sashini, and this plant.

Gaj pippul (*Scindapsus officinalis*).—A parasite, the fruit is used in medicine.

There are others, such as the *kántú kachu*, *kántú mán*, but they belong to hilly districts, the former is a remedy in native diseases.

Shvet bach (*Acorus calamus*).—Sweet flag. A substitute for bark, the leaves are fragrant, and the root tonic and anti-febrile; given to children in cases of dyspepsia attended with dysentery. Linnæus observes that it is the only native aromatic plant of Northern climates.

81. CYPERACEÆ.—Sedge tribe. Might be called the "grass of the water." Distinguished from grasses by having solid, angular and unjointed stems. Their not having joints was known to the Romans, who hence invented the proverb "*nodum in scirpo queris*." The order, though not handsome, has its name *Cyperaceæ* from the Cyprian Venus. 212 species are known in New Holland. A paper was made from one of this order—the papyrus—why may not others answer the same purpose? Sedges have not, as grasses, nutritive qualities.

Jál muti (*Cyperus pygmaeus*).—Seeds three-sided.

Páti (*Cyperus inundatus*).—Stalk exactly a triangular shape. It serves very much, like the bent grass in Holland, to bind the banks of rivers, which are overflowed by the tides: mats are made from it.

Chunchá (*Cyperus compressus*).—Many of the leaves are longer than the stalk.

Gol methi (*Cyperus seminudus*).—No leaves, eaten only by buffaloes.

Mutha (*Cyperus hexastachyus*).—Hogs very fond of the roots, hence the natives use them when dried and powdered as a perfume at their weddings and as a tonic and stimulant in cholera. The Sanskrit name for a hog is *mastad*, i. e., "the matha eater."

Nāga muthā (*Cyperus pertenuis*).—Roots used by Indian women for perfuming and cleaning their hair, hence its name—the *Nagar mutha*, i. e., "city or polite grass."

Gol malanga (*Cyperus Roxburghii*).—Stalk sometimes twenty feet long.

Mādur kālī (*Cyperus pongorei*).—So well known for the mats made from its stalks; another of this genus, the *chāmāti pāti*, is useful for binding banks together.

Shvet Gothabi (*Kyllingia monocephala*).—Its fragrant root is reckoned an antidote to poisons. The exclusion of light turns plants white, but in this plant, when the heads are shaded, they are generally more green.

There are others, as these—the *chota gothabi*, *barithi*, *bara chuncha*, *behuyā*, *pāni molangā*, but there is nothing particular to note of them.

Keshār (*Cyperus kysoor*).—Indian bulrush. The roots are eaten in fever, and given as offerings to the deities.

Chencka (*Limnochloa plantigenea*).—Seeds beset with bristles.

82. GRAMINACEÆ.—Grass tribe. The name "Grass" is common to the Sanskrit (*ghas*) Anglo-Saxon, and Icelandic languages. Out of more than 2000 species known, scarcely more than one is really unwholesome. Cattle feed on the leaves, men and birds on the seeds. The cultivation of the various species of grasses is much neglected in India, though they are so useful in binding the soil.

There are many, as the *shvet gothubi*, *keshori malangā*, *talnara*, *karatīyā*, *bara kardīyā*, *chunchu murmurā*, *pat*

patichenchaká, bara keshoryá, of which there is nothing particular to note.

Mayná or Kodu (Paspalum stoloniferum).—Seed used instead of rice. Cattle very fond of it.

There are others, as the *kangu jumyá, chitrichirye, patinur, chota galgánte, chin ghás, baranda barethi, naradal, jupikangká, nákagáli jálgánt, ponginachi bajrá, shonti ghás*, of whom nothing particular is to be noted.

Chiriyá ghás (Helopus annulatus).—Flower cups very hairy.

Kangu (Panicum Italicum).—Called in Sanskrit *priyangu*, as its seeds are eaten by natives. It yields fifty-fold, and two crops in the year.

Dal (Panicum stagninum).—The stalks towards the base rest on the ground, and strike root, above erect for two feet. Flowers three-fold below, above in pairs; fond of swampy ground.

Sámá (Optismenus colonus).—Seeds an article of diet. Yields fifty-fold; the *bara shámá* of this genus is made no use of; there is also the *dámrá shama*. At the Durgá Puja festival the Hindus use the *shama* along with the plantain leaves and *bel* fruit to make the figure of a wife for Gonesh.

Juyár (Sorghum vulgare).—Indian millet. Its long awns protect the grains from the rapacity of birds; it yields a hundred-fold. Though the straw is thick and solid, yet all kinds of cattle are very fond of it. The *káta* and *sádhá debdhan* of this genus are also used for food.

Chorá kántá (Chrysopogon acicularis).—Persons walking in the jungles will remember this from its troublesome seeds sticking so much in the stockings, and causing itching.

Ulu (Imperata cylindrica).—After the first rain in May, the fields are white with this, which presents a beautiful sight; the whiteness is caused by the quantity of cereal that surrounds the insertion of the flowers. The Telingas use it in marriage ceremonies, the Bengalis for thatch.

Kásh (*Saccharum spontaneum*).—The great quantity of a silver-coloured wool which surrounds the base of the flowers, entitle this to its Sanskrit name *kásh*, or “the shining” a name for Benares also. Useful for mats, thatching, and as food for buffaloes.

Páti khári (*Saccharum fuscum*).—Native pens made from the stalks : also used for light fences and screens.

Uk (*Saccharum officinalum*).—Sugar-cane. Venetians imported it from India prior to 1148 : introduced by the Saracens into Sicily, Rhodes, Crete : its Sanskrit name *shukar*, the origin of its Latin and English names. It has been indigenous in Bengal from the earliest period, being a favorite present to the Gods, and used by native doctors for diseases of the chest and worms : given also as an antidote to arsenic. The process of claying sugar was discovered by accident, a hen with muddy feet having walked over a cooler full of sugar, it was noticed that where the clay from her feet had remained, the sugar beneath it was altogether cleared. The three principal kinds of sugar-canes in Bengal, are the *kajure*, or purple-coloured, growing in a dry soil, the *puri*, or light-coloured, and the *kullor*, or white, growing in swampy lands.

Teng (*Saccharum procerum*).—Stalks used for screens.

Shar (*Saccharum sara*).—Arrow-cane. Its long stalk of twenty feet, with the beautifully soft silky hairs of the flower waving in the wind, gave it the Sanskrit name *gundra*, “the playful,” and *shara*, “the arrowy.” It is often mentioned in the Puranas, the Indian god of battle, Kartikeya, having been born in a grove of it, which burst into a flame. The gods gave notice of his birth to the nymph of the Pleiads, who descended and suckled the child. Menu directed that the holy threads of the *paita* should be made from the culms of this, as being holier even than *kusá* grass. From the leaves tow ropes are made by the Allahabad boatmen.

Khaskhas ghás (*Andropogon muricatus*).—It is a fragrant grass. The Botanic name means bearded, *i. e.*, having a tuft

of hairs on the flower. An infusion of the root is taken in India to produce perspiration in fever; an ointment prepared from the root is also used to destroy lice. Used in the Deccan for thatching bungalows. *Bena* is the name of the plant, and *khushkus* of the root. The poets have given nine names to it thus arranged in a Sanskrit sloke:—

Abhaya, nalada, sevyu, amrinala, jalásaya,

Lamajjaca, laghulaya, avadāha, ishtakūpatha.

Gandha vena (Andropogon schwananthus).—Lemon grass; known by its smell, which resembles a mixture of roses and new mown hay. Useful in colds and head-aches to produce perspiration. The infusion of the leaves is esteemed by Indian doctors to be an excellent stomachic, and a substitute for tea; the natives of the Moluccas extract from them a pleasant essential oil. The young propagating shoots issue from the axils of the leaves. Leaves near the root bifarious: the fresh ones much used as a substitute for tea. Tonic, slightly stimulant; centre of the culm used to flavour curry. Sanskrit name *mūlātrinak*, “grass-garland”—*blustrinang*, “an earth-grass.” Cultivated in Arabia, Ceylon, and the Moluccas. The Native governments so valued pasture grasses, that some of the pasture of the sandstone hills, south of the Kistna river, where the lemon grass is found, was reserved for their own cavalry.

Pāni shirā (Hemarthra compressa).—Stalks very long and very thin.

Bāksā (Rottbolla glabra).—Grows in moist places near paddy land; leaves sword-shaped.

Makkā (Zea Mays).—Maize. It is the rice of Mexico and the United States. Indigenous to America, hence its name Indian corn. The pride and boast of American husbandry. Extensively cultivated in Egypt, Java, and Africa. It has a jointed stalk with alternate leaves like flags. The stalks are surmounted with a loose bunch, or spike of male flowers, of various colors, having oblong oval chaffy

empalement, opening with two valves, each enclosing two flowers. Seeds sometimes blue, green, red, or yellow. From each seed issues a filament, which when cut, the tree will remain barren. There are thirty different kinds. Sometimes fourteen feet high. Often *yields* four hundred per cent. The *Indians* of N. America used to sow it at the time a certain tree budded. A sugary juice is obtained from the *stalk*. The cause of the indigenous civilization of many of the Indian tribes. The spathe, or delicate elastic leaves, enveloping the grain in its head, is used for bedding. Named along the Dardanelles "reed wheat."

Kanch gargar (*Coix lacrymā*).—Called "Job's tears."

Benā yonī (*Sporobolus diander*).—Flowers in the rainy season.

Pāni durbā (*Sporobolus tenacissimus*).—Abundant in the West Indies.

Dhān (*Oryza sativa*).—Rice. The chief food of one third of the human race, hence well entitled to its Sanskrit name *vrihi*, "the spreader." Forty or fifty different kinds of rice are known in India, and more than a hundred in Ceylon. Menu writes of rice wine, called *pishti*, i. e. arrack. Though a bag full of it was introduced into America only two centuries ago, yet it produced in 1850 more than 215,000,000 lbs. The Santals use immense quantities of a spirit prepared from rice in their feasts and religious ceremonies. The Chinese apply lime water to rice with great success; we know not whether that has been tried in Bengal. In North America the sowing rice in damp fields is very prejudicial to the health of the negroes, so also in Lombardy; it is not so in Bengal.

Durbhā (*Cynodon dactylon*).—Three-fourths of the food of horses and cows in India is made from this grass. Some of the leaves tapering very sharply, have given rise to the Hindu saying of an acute man, his "mind sharp as the point of a *kusa* leaf." A cooling decoction is made from its roots by native doctors. Sir W. Jones says of its flowers "they are

among the loveliest objects in the vegetable world, and appear through a lens like minute rubies and emeralds in constant motion from the least breath of air." The ancient Hindus believed it was so beautiful that a nymph had taken up her residence in it.

Nal or Darma (Amphidonax karka).—Indian reed. The Greeks used to say that reeds had contributed to subjugate a people by furnishing arrows, to soften them by framing musical instruments, to educate them by forming pens.

Yaba (Hordeum hexastichon).—Barley. Native place unknown.

Gom (Triticum vulgare).—Wheat. Flowers in the cold season.

Kush (Poa cynosuroides).—Used in Brahmin ceremonies.

Báns (Bambusa arundinacea).—The cells and partitions are so large that they are used as cases to contain papers. The stem of all the grass tribe is originally solid, but owing to its diameter increasing more rapidly than new tissue can be formed, it becomes hollow. A flinty substance called *tabasheer*, or in Sanskrit *tvakkshárú*, is found in some female bambus; it is indestructible by fire, and is used as a tonic in medicine.

Tulda bans (Bambusa tulda).—Common bamboo. Thick shoots used for pickle; a thicker sort is the *piga bansh*, used for scaffolding, as the *bánsini bansh* is for basket-making, and the *behuri bansh* for a Brahmin to hold when invested with the páita, there is also the *bálku báns*.

CRYPTOGAMÆ

Whose fructification is hidden, unknown, or irregular.

83. CHARACEÆ.—Aquatics; always submerged; give out a foetid odour. With a microscope the motion of fluids in them can be seen.

Called in English stone-worts from the lime in them. Their stems being encrusted with carbonate of lime may be of use as a manure; the abundance of this weed is one of the sources of the malaria of the Campagna of Rome. The fens in Cambridgeshire are adding year by year earthy matter in abundance from the deposit of *Characeæ*, which thus elevate the low, swampy soil.

Kantá Jjáŋghi (*Chara verticellata*).—Joints of the stems somewhat prickly.

Pátá Jjáŋghi (*Chara involucrata*).—Used to purify water and sugar: it attracts the filthy particles out of the objects with which it is connected.

Rasna Jjáŋghi (*Chara furcata*).—Said to cause rice to rot that grows near.

84. *EQUISETACEÆ*, or *Shave Grasses*.—A name they have from their flinty stems cutting the mouths of cattle; hence they are useful for polishing furniture.

85. *POLYPODIACEÆ*.—Ferns called *Dolypodia*, from having many roots. The ashes of some ferns form a potash used in making glass; the roots of others are sudorific. In Norway, Scotland, and Himalayas, ferns are cooked and eaten. Heat and shade are necessary for their growth.

In the Madras Presidency is a fern (*Adiantum melanocaula*) called *mayur shikhandá*, from the resemblance it bears to a peacock's tail: the *káli jhamp* in Bengal is of the same species. In Jamaica, the same class are used for sore throats and consumption. The *veins* are all of equal size.

Chitúá borá (*Polypodium glabrum*).

Garur (*Polypodium quercifolium*).—Abundant in New-Holland.

Dápu (*Polypodium proliferum*).—Root used in fever.

Chákulyéá (*Hemionitis cordifolia*).—Used as a medicine in connection with native *páŋchan*, or compounds.

Pánkánkrul (*Aspidium unitum*).—The *inclusium*, or covering, is shaped like a buckler, hence its name. Forty genera known.

Kālī Jhāmp (*Adiantum leonatum*).—Called *adiantum*, or dry, from the nature of its stems, which, though you plunge in water, you cannot wet.

86. MARSILEACEÆ.—Creeping plants, living in ditches.

Susni shāk (*Marsilea quadrifolia*).—Leaves eaten produce sleep, according to native accounts.

87. LYCOPODIACEÆ, or *Club Mosses*.—Derive their Botanic name from a fancied resemblance to a wolf's foot. Moss-like plants, with creeping stems and leaves, tile-shaped; they are a link between ferns and mosses. The *thecæ* contain a powder very inflammable, used in fireworks and in theatres to produce artificial lightning.

Sitāhār (*Lycopodium phlegmarium*).—In the Sunderbunds chiefly.

Hātājora (*Lycopodium imbricatum*).—Flowers in the rains.

88. MUSCI, or *Mosses*.—They have been called the corals of the tree. Dr. Wallich collected in India 148 different kinds of mosses, but very few are to be found in the alluvial soil of Bengal, and with no distinct native name.

89. HEPATEACEÆ, or *Liverworts*.—Few in Bengal.

90. LICHENACEÆ.—Valuable for dyes: 2400 species known.

91. FUNGI, or *Mushrooms*.—The Ostiacks, a Siberian tribe, make a preparation from a mushroom (*Agaricus muscarius*) which will kill the strongest man in twelve hours. The Russians during their fasts live entirely on mushrooms, and are often thrown into violent convulsions in consequence.

Mushrooms develop their cells with wonderful quickness, one has been known with cells $\frac{1}{400}$ of an inch in diameter to have developed at the rate of 66 million cells in a minute, and continuing that for 12 hours: cells in aquatic plants are ordinarily $\frac{1}{50}$ of an inch in diameter. The old cell of *fungi* is transformed into a new plant by new cells originating in it and gradually taking its place.

The old Pandits so detested *fungi*, that they put in the mouth of Yam, the Regent of Death, the following words:

"Those who eat mushrooms, whether springing from the ground or growing from a tree, fully equal in guilt the killers of Brahmins."

Twenty different species are known, but without distinct native names, all are called *bāng-chátta*, i. e., "the frog's umbrella," corresponding to the English name *toad-stools*, and the Urdu *samp-ki-topi*, or "snake's hat." One species is edible, and may be distinguished by its being of middle size, the gills of a flesh colour, changing as they advance to a chocolate, and of an agreeable smell.

Korak (Agaricus edulis).—Eaten by natives when boiled in oil: the widows of Brahmins and Khayists will not eat this fungus, from a notion that it springs from stolen meat buried in the earth.

92. SALVINIACEÆ.—Floating plants, with reddish stems. Order named after a Professor of Botany at Florence.

Páná (Salvinia imbricata).—Flowers in the rains.

Indukáná páná (Salvinia cucullata).—Leaves shaped like rat's ears, which they are like.

Táká páná, Ulki páná (Salvinia verticellata).—Its name *ulki*, means "a Hindu sectarial mark on a woman's forehead," which it resembles.

CONCLUSION.

1. I have now completed the "Notes"; it would have been easy to have made them ten times the length, but the object has been, not to write a *Flora Bengalensis*, but simply to give brief remarks on some of the leading indigenous plants. This little work, it is hoped, may be suggestive to Europeans residing in the Mofussil, who wish, amid the solitude of a country life, to have objects of interest around them when they walk out, and who desire to know something of the properties and structure of the indigenous plants in their neighbourhood, but may not have the opportunity of consulting

the forty or fifty different works, scattered through which notices of those plants are to be found. Hence brevity in the description has been studied.

2. The following books have been consulted in compiling this work, and are recommended to those in search of further information :—

Simmond's Commercial Products of the Vegetable Kingdom, 1854; *Archer's Popular and Economic Botany*; *Sir W. Jones' Descriptive Catalogue of 78 Indian Plants*; *Hooker's and Thompson's Introductory Essay to the Flora Indica*; *Drury's Useful Plants of India*; *Transactions of the Agri-Horticultural Society of Bengal*; *Spry's Suggestions*; *Graham's Catalogue of Plants growing in Bombay and its Vicinity*; *Lindley's Vegetable Kingdom*; *Mason's Notes on the Flora of the Tenasserim Provinces and Burman Empire*; *Voigt's Calcutta Hortus Suburbicenis*; *Roxburgh's Flora Indica*; *Decandolle's Geographic Botanique*; *Ainslie's Materia Indica*; *Wise's Hindu Medicine*; *Wight's Illustrations of Indian Botany*.

Among native works that have been consulted, are the *Talif Sherif*, translated by Playfair, the *Ayur-Veda-Darpan*, *Chikitsárnab*, *Chikitsá Ratnákara*, *Sárkaumadi*, *Drabyea-Guna*, besides a number of MSS. works of the Vaideya, or Doctor Caste. There is many a valuable remark lying buried in those books, the result of long observation, which, if translated into English, would be of great service. Dr. Wise in his "*History of Hindu medicine*," and Royle in his "*Antiquity of Hindu medicine*," have done much to bring the merits of native works on medical botany to public notice.

3. The writer of these notes can bear his testimony to the interest lent to many a solitary ramble in the jungles by having as a subject the observing the peculiarities of *indigenous* plants. Every month in the year gives some new phase to the vegetable world, so that constant variety is afforded. This study is a means also of realising more the power, wisdom,

and goodness of God. We cease to have so much admiration for man's skill, or the curiosities of cities, when we see in the commonest weed a beauty of structure and adaptation which man cannot equal with all the scientific developments of the 19th century. This study is of value to the European in another point of view, it brings him more in contact with the common people, and tends to produce a kindlier tone towards them, as he finds that many, though having no book lore, yet are close and accurate observers of nature, and take a real interest in the objects of natural history. The writer has often been surprised at finding how matters considered known only to botanists were familiar to a common man, and he believes that no peasantry in the world excel the Bengali ones in powers of observation and "folk lore." It is to be regretted that they should be denied by the State, and by their own wealthy countrymen, the means of a sound elementary education, as many a Hugh Miller or Burnes may lie among them in embryo.

4. No one can peruse such works as "*Royle on the Fibrous Plants of India*," or "*Drury's Useful Plants of India*," without feeling what treasures, hereafter to add to the resources of this country, may lie hid in the indigenous plants of Bengal, but they need being tested by a scientific hand. Though natives apply them to many purposes that Europeans little think of, yet their use in arts and manufactures have still to be developed by the European mind. Of how little value was the indigo in India for ages, though fifteen centuries ago it had the Sanskrit name of *banikbandu*—the merchant's friend; and so with respect to a large class of fibrous plants. The natives use for TANNING the bark of the *bábul* and *gharan*, the rind of the *dálim* fruit, the juice of the wood of *khuerá*, the seeds of the *supari* and *huritaki*. In DYEING they employ the roots of the *ach*, *haldi*; the wood of *bakam*; and the bark of *jám*, *piyará*; the leaves of *sim*, *aparajita*, *níl*; the flowers of *kusum*, *jabá*, *sipháliká*; the fruit of *pui*, *lalkan*,

pánsioli; Gums are obtained from the stems of *káshmiri*, *bat*, *ashvath*, *chhátim*, *sayambar*, *amrá*, *jjuli*, *háparmáli*, *ákanda*: SOAP is made from the *nárikel*, *sarshap*.

5. This work, when translated with adaptations into Bengali, it is hoped may be of use in schools. One of the greatest wants in Bengal at present is trained *malis*, men who know not only *what* to do, but *why* to do it, who having some knowledge of the structure and classification of plants, can deal with a new plant in a scientific and not merely empiric method. The Agri-Horticultural Society have recognised the principle by the money they gave to the formation of a school for training young *malis*, though it has not yet succeeded, owing to the apathy of zemindars, and the difficulty in getting a suitable class of boys. We trust the day is not distant when, as in France and Germany, the elements of agricultural science shall form a subject of study in all schools in rural districts in Bengal, and when a work on the plan of these "Notes" shall form one of the class books. The substance of these "Notes" was delivered in a course of lectures in Bengali to pupils of a village school at Thakurpukur, and, though none of them understood English, yet it was surprising with what ease they acquired the principles of the *natural* system of botany. It is certainly more natural to the common people than the Linneæan, which judges of plants by the same narrow view as if the various races of mankind were to be classified according to the size and length of their noses.

6. The author published several years ago an Introduction to Botany in Bengali, of which 2,500 copies have been sold: in it he has used instead of difficult and hard Latin and Greek names, terms derived from the Sanskrit and used in Bengali, and he has been delighted in seeing how easy the study became when indigenous terms were used that defined themselves. On the other hand, he began to teach a class of natives botany through English, and he had to give it up in sheer despair,

such difficulties were interposed by the scientific nomenclature. He therefore fully sympathises with the following views of Professor Lindley: "No one who has had experience in the progress of botany as a science, can doubt that it has been more impeded in this country by the *repulsive* appearance of the *names* it employs than by any other cause whatever; and that in fact this circumstance has proved an invariable obstacle to its becoming the serious occupation of those who are unacquainted with the learned languages." A Latin and Greek nomenclature is necessary for scientific students, but it is a complete barrier to *popular* study, and especially in India, where little attention is paid to Latin and Greek. I give here a specimen of the way Latin and Greek botanical terms have been rendered by me into the Bengali language:—

<i>Botany</i>	Plant knowledge.	<i>Hastate</i>	Spear-shaped.
<i>Bract</i>	Flower-cup leaf.	<i>Ovate</i>	Egg-shaped.
<i>Calyx</i>	Flower-cup.	<i>Pericarp</i>	Seed-bag.
<i>Campanulate</i>	Bell-shaped.	<i>Parasite</i>	Son of a tree.
<i>Crenulate</i>	Notched.	<i>Petiole</i>	Leaf-stalk.
<i>Endogen</i>	Inward grower.	<i>Pinnate</i>	Feather-shaped.
<i>Exogen</i>	Outward grower.	<i>Peduncle</i>	Flower-stalk.
	<i>Subulate</i>	Awl-shaped.	

7. The vernacular names of plants are constructed on the principle applied generally to oriental names, viz., denoting by the name some leading property or peculiarity of the object. The Bengali peasants have great power of observation, and the epithets they apply to plants shew they understand the principle of "eyes and no eyes." To the European, the knowledge of these names is valuable, not only as leading to things, but also for serving as a *memoria technica*, to enable one to recollect names.

8. Nor have the English peasantry been inattentive to this principle of significant vernacular names, though of late years

an immense number of Latin *sesquipedalia verba* have been introduced. The following list of English names of plants shews that the common people in England as well as in India, like an expressive epithet which defines itself: *Adam's Needle*; *Bachelor's Button*; *Bead-Tree*; *Bind-Weed*; *Bladder-Nut*; *Buck-Thorn*; *Butter-Cup*; *Devil's-Bit*; *Dog's-bane*; *Duck's-meat*; *Goat's Beard*; *Goose-grass*; *Hedge-Hog Thistle*; *Honey-suckle*; *Lady's-Bower*; *Lady's-Finger*; *Lady's-Slipper*; *Mad-Apple*; *Mouse-Ear*; *Old man's Beard*; *Passion Flower*; *Purg-ing-Thorn*; *Snow-Drop*; *Worm-Wood*. Similar examples may be given from French, and above all from German, which has made all technical names *self-defining*.* Many of the plant names in Europe are very expressive in their original language: thus *Coco*; *i. e.* the Cocoa-nut-tree, is a Portuguese name meaning to grin, because the 3 holes of the nut resemble a monkey grinning; *Olive* is Galic for oil, *i. e.*, the oil yielding plant; *Pomme de terre*, the French of apple, *i. e.*, "the apple of the earth." *Rubia*, the Latin for Madder, *i. e.*, "what dyes red;" *Geranium*, in Greek means Crane's bill, as the seeds are so shaped; *Lupinus*, *i. e.*, "what exhausts the land like a wolf;" *Currants*, *i. e.*, whose native place was Corinth.

9. The following selection of the Bengali names of plants, with their meanings, illustrates the above remarks:—

Amáddá.—Smell like a green mango.

Ananta mul.—Its roots spread very widely; another of the genus is called the *shut mul* or hundred mouthed.

Bágh ángkrá.—Its tendrils grasp like a *tiger's paw*.

Bágh nakhi shim.—The beans shaped like a *tiger's claws*.

Báj báran or *tristrá*.—People place it on the roof to prevent lightning or a thunderbolt falling, it is the native lightning conductor.

* There is a German work, "*Handbuch der Botanische Terminologie*, 4to., pp. 581, which gives in German all the technical terms of botany. The Germans have always used indigenous terms in popular scientific works.

Bháng chátá.—The frog's umbrella, English toadstool.

Bish tárah.—Its leaves used for poultices in poisons.

Bhui dumur.—*Picus repens.* A fig tree which trails on the ground. The common fig rises a pretty fair height in contrast with this one which cleaves to the earth.

Chámuri.—Flower is shaped like a horse's fan.

Chupri álu.—Potatoes large as a basket.

Chhágál bánti.—Its fruit is like a goat's nipples.

Deri latá.—Its flower shaped as an (*dheri*) ear-ornament.

Dhání lángká.—The fruit chili, short as rice grain.

Ganda bená.—The scented grass.

Ganda ráj.—King of scents: being very fragrant.

Gol álu.—The round vegetable; the French call the potato "the earth-apple."

Ghríta Kumári.—*i. e.* the plant which leads a short life as a virgin, and whose juice is like ghee.

Hár bhángá.—Its juice said to unite broken bones; another name is *hárjgorá*, "the bone-uniter".

Háti surá.—Its flower shaped like an elephant's trunk.

Him ságar.—Its leaves are an ocean of ice to the touch; another plant the *Dol Samudra* is so called from its waving, hence its name "an ocean of waving".

Indur Kána pana.—Leaves shaped as rat's ears.

Jagyadumur.—Used in the *agnihom* or fire-sacrifice at marriages, which couple together.

Jumka lata.—Its flower shaped as an earring.

Kanak champá.—Flower like gold in color; there is another *champa*, the blue, whose flower-stalks spring from the earth, and the *dulal*, or pleasing *champá*, *i. e.*, its flower is fragrant.

Kukur jihba.—Leaves shaped as a dog's tongue.

Lajjábati.—or English sensitive plant, has blushing leaves.

Matkaráí.—Peas grow in the earth, sold in Calcutta as the *China báálám*, or Chinese almond, but it is a different plant.

Murog phul.—Its flower like a *Cock's-crest*. Similarly the English cockscomb.

Nág keshar.—Its flowers are like a *snake's hood*.

Nimuki.—Its leaves *without a point*. The leaf-stalk springs from the centre of the leaf.

Ol kopi.—A cabbage whose stem is like *the ol*.

Páni marich.—An *aquatic*, pungent as *pepper*, having its fruit from the water.

Páni phul.—Its nut, which is called *singáhár*, *i. e.*, shaped with projections like a cow's horn, purifies the water.

Phani manasá.—The manasa with a *snake's hood*. Lac is made from the insect which feeds on it.

Phul hopi.—The *cabbage flower*. The English name is similar to *cauliflower*, *i. e.*, stalk-flower.

Rajani gandha.—The *night-scenter*. It opens its flowers at night, and diffuses a beautiful scent.

Shákar kanda álu.—Its fibres shaped as the *ság*.

Shank álu.—Its root shaped as a *sea-shell*.

Shul páni.—Leaves shaped as a *spear*.

Solá kachu.—An arum, light, *spongy as the solá*.

Sapta parni.—Has *seven leaves*.

It is to be regretted that Europeans, instead of teaching *malis* to murder Latin names, do not themselves learn the native names, which they would find often very valuable as a key to the nature of the plants, in various cases serving also as a means of more easily remembering them.

10. Proverbs also show, as well as names, how natives observe. The Bengali language is rich in proverbs, which, like all proverbs, are "the great universal voice of humanity, the edge-tools of speech which cut the knots of business." We give some of these relating to the plant world, which have never appeared in print before;—they are the language of nature.

"We see you as seldom as the DUMUR flower." (*Tumi dumarer phul.*)—Applied to a person rarely seen, as the *dumur* seldom flowers.

"By the ISHWARMUL the serpent is silenced." (*Ishwar mule sáp jjabda.*)—The smell of the *ishwarmul* is used to stupify snakes, who therefore dread it as the thieves do the magistrate.

"He throws pearls among BENA groves." (*Bena bane muktá charána.*)—Like "casting pearls before swine."—The pearl is of no use in a jungle—

"Full many a flower is born to blush unseen,
And waste its sweetness on the desert air."

"The Rajas are fighting, the ULU GRASS and reeds are destroyed," (*Rájá rájái judha hai, ulu kánkhrár prán jái.*)—Like "Reges delirant plectuntur Achivi," subjects suffer for the quarrels of their rulers.

"Hanging a man for stealing POT-HERBS." (*Shák chorke shul.*)—A severe punishment for a small offence.

"The storm strikes the HIGH TREE." (*Bara gáchheá, bara jjar.*)—Great men are peculiarly exposed to calamity.

"The PALM TREE increases by bearing its bushy head uncut; the WILD DATE increases by cutting it yearly." (*Tál báre jhope, khejur báre kope.*)—You must not have the same rule for all.—"One man's meat is another man's poison."

"If the KASHA flowers, the rains are ending." (*Phutile kashe phuráila barsha.*)—The *Káshá*, or shining, is a beautiful cottony grass, which is in full blossom at the close of the rains. It is equivalent to "look to the signs of the times."

"It is the fine MA'KHA'L outside, but its inside is bitter." (*Máhhálpheá, bhitare kála.*)—Applied to a handsome fool.

"Like the CUCUMBER's holes, not on the outside." (*Shas-hár phák.*)—Fair without, foul within.

“*He can place many on the TOP OF THE TREE.*” (*Gáchhe utáite aneke páre.*)—Like leaving one in the lurch. Leading them into a difficulty, but not getting them out of it.

“*The stroke of the sword is as the SIZE OF THE TREE.*” (*Jhope bhuje kop.*)—You must proportion the exertion to the object to be attained.

“*Things will come round, as the WINTER RICE after the ausor or rainy rice.*” (*Jakhan kár jeman, aus phuráile eman.*)—“Sorrow may endure for a night, but joy cometh in the morning.”

“*Poor fellow he is as an AMRA tree in winter, only seed and bark.*” (*Haire ámrá, kebal ánti O chámrá.*)—Applying for money to a rich man who has fallen into poverty, and is therefore in a wintery state of his circumstances.

“*When the RICE is ripe he gives a harrow.*” (*Páka dháne maí deoyá.*)—A thing done out of season, like “locking the stable when the horse is gone.”

“*He eats only the root of the SHALUK, his teeth are black, yet people say he is well.*” (*Sháluk kheye, dánt kála, loke bale áchhe bhála.*)—Respectable natives blacken their teeth for ornament, a mark of a respectable condition: the poor man’s are blackened from eating the shaluk herb, and he has therefore the appearance of well to do.

“*The RADISH pulled up grows not again, not so the BEGUN.*” (*Mulá báre nai, begun báre.*)—The miser gives once, as the radish’s root grows only once; the generous gives often, as the begun, if pulled up, grows again.

“*The OL says to the MA’NKACHU ‘why are you bitter.’*” (*Ol bale mánkachu bhái, tumi kena lága.*)—The roots of the *ol* are acrid when raw, and exhale when flowering a great stench, so that flies supposing it to be carrion cover the flower branch with their eggs, the *mán kachu* root is also acrid, as they both belong to the same family, whose roots are

acid. Equivalent to the English proverb "the kettle calling the pot black."

"He mounts not the tree, yet expects a bunch of fruit." (*Gáchhe ná utite ek kháñdi.*)—You must use the means.

"The JACK FRUIT hangs on the tree, yet he applies oil to his whiskers." (*Gáchhe kántál, gope tel.*)—Doing a thing before the time; the oil is put on the whisker when the jack is on the table; similarly the Hindus say "he fastens the door where there is no house."

"The finger swells equal to a PLANTAIN tree." (*Ángul phulle kalágáchh.*)—An improbable story, the plantain's stem being very thick.

"The crow eats the JACK FRUIT, but its juice is on the bak's mouth." (*Káke khái kántál, baker mukhe átá.*)—Attributing your own fault to an innocent person: the bak bird lives in the water, and does not touch the fruit.

"As is the WILD OL such is the ripe TAMARIND." (*Jeman buna ol, temani pákhá tetul.*)—The tamarind juice counteracts the effect of the wild ol: for every sin there is punishment, for every poison a remedy.

"When the BEL fruit is ripe, what can the crow do." (*Bel pákile, káker ki.*)—When the bel fruit is ripe, the crow cannot break the hard shell:—applied to a work which cannot be done after a given time.

"A pole to reach the BEGUN fruit." (*Begun gáchhe ánkurshi.*)—Equivalent to the English, "a steam-engine to cut cabbages."

"A BAMBU dies by flowering once, a man by wandering about." (*Báns mare phulle, Mánush mare bhule.*)—This singular fact about the bambu is applied like the English, "a rolling stone gets no moss."

“A race like the UCHHEA plant, all bitter.” (*Jhár, jhár, uchheár jjhár.*)—The uchhea's leaves and fruits are all bitter,—applied to a family all whose members are bad.

“The branch of the BAMBU is sometimes harder than the bambu itself.” (*Bánsheer chheye hunchi shakta.*)—Applied where a son is superior to his father.

“As the SHYEAKAL thorns.” (*Shyeákuler kántá.*)—These thorns are so curved, it is not easy to disentangle clothes from them,—applied to an enemy difficult to get rid of.

“One whose head is shaved, does not go a second time under the BEL tree.” (*Nerá kai bár bel talai jái.*)—The bel fruit falls heavily on a bare head,—corresponds to the English “a burnt child dreads the fire.”

11. The Sanskrit names of plants have been often given in these “Notes” and are of importance in ascertaining whether a plant is indigenous or no. Monsieur Decandole, who in his *Geographie Botanique* has written so fully on the tests for indigenous plants, lays down the principle that a Sanskrit name for a plant is a sure indication that it is Indian. He writes thus, “The Sanskrit is of immense value in ascertaining whether or no plants in India are indigenous. It was a dead language when Alexander invaded India. Every plant indigenous to North India ought to have a Sanskrit name, if it is of a nature to strike the common people, or presents any peculiar property. The Sanskrit, though a dead language, yet has remains of great works and local traditions.” The *Amera Kosh*, edited by Colebrooke, is very valuable as a reference for the Sanskrit names of plants. Ainslie, Royle, and others who have written on Indian plants, have recognized the value of the Sanskrit names in connection with Botany.*

* The writer was puzzled by the fact that the *Tamarind tree*, which has various Sanskrit names is yet admitted by botanists not to be a native of India. At length he ascertained it was a native of Java, when the whole question was cleared up,—the Brahmans were once colonists in Java.

12. Nor have the charms of Sanskrit poetry been withheld from indigenous plants. Kalidas, the Indian Wordsworth, in his poem on the seasons and in his dramas, is enthusiastic on the beauties of the vegetable kingdom. The Ramayan, composed 2500 years ago, has many beautiful passages descriptive of rural scenery, and of the indigenous plants in the neighbourhood of hermitages. Sanskrit poetry may be pre-eminently called the poetry of nature: we see it in the songs of the Vedas, chaunted by the Aryan Brahmins on the banks of the Indus, in the strains of Valmiki and Vyas, in all their dramatic literature, and even in their poetry on metaphysical subjects.

Indigenous plants are a source of constant illustrations in Sanskrit poetry, thus the "*mango* the harbinger and soul of spring," "eyes restless as the *water-lily*," "heart trembling as a *plantain leaf*,"—"fate sporting with men as a drop of water trembling on a *lotus leaf*,"—"joy after terror as a *lotus* opening its leaves after the night"—"women like *flowers* are of tender fabric, and should be handled gently,"—"an intellect sharp as *kusa grass*,"—"death kills by gentle means as the *lily* by melted snow,"—"a good woman surrounded by evil company as the chaste *mimosa* by poisonous herbs."

13. The list of indigenous plants given in these Notes embraces only those grown in the delta of Bengal, i. e., from Rajmahal, the apex of the delta, to Midnapore and Dacca, its bases; they all grow in soil of alluvial formation.

It does not include those of Assam to the East, nor of the Midnapore, Orissa, and Bancoorah hills to the West, nor of the Rajmahal hills to the North, nor of the Sunderbunds. Assam for instance abounds with orchids, and in Robinson's Assam various particulars of its vegetation are to be found.

The oldest naturalized plant in this country is the *tetul* or tamarind, introduced before the Christian era from Java to

India, then the *rose* from Persia brought in probably with the Patans. Peru has furnished the *surjeamukhi*; South America the *phani manasá*; China the *gandharáj* and *lichi*. Few natives will believe that the *pepiyá* is not indigenous, yet there is no doubt that, like the potato, it is of South American origin, and is one of the few remembrances the Portuguese have left behind them. The *shyeál kánta* is remarkable for the extent to which it has spread over Bengal, the writer has seen it near Sasseram, yet it was introduced from Mexico two centuries ago. We have an illustrative case in the *Briophyllum calycinum*, which was introduced by Lady Clive toward the close of last century, but is now found every where in Bengal.

14. THE MARRIAGE OF CERTAIN PLANTS is a curious custom among the Hindus, the *ashvatha* is regarded as the male, and the *bat* the female, and it is accounted an act of merit according to the Puranas to wed them; travellers enjoy rest under their shade. A priest performs the ceremony, the expenses connected with which amount to about 40 rupees. It takes place in April generally. Some females plant the *bat* and *ashvath*, and water them with their own hands for several years.

Connected with this is the WORSHIP OF VARIOUS TREES; the *ashvath* is sacred to Vishnu, the *bel* to Durgá, the *bat* to Sita, the *manasá* to the goddess of snakes. The *ashvath* or *pippul* is regarded as a very holy tree by the Hindus; the Brahmans say Vishnu sat on its leaves, while the common people view the tremulous motion of its leaves as caused by a *bhut*, or ghost, sitting under each and setting them in motion. It is every where, under the name of the *bo* tree, held in the greatest esteem by the Buddhists, who regard its quivering leaves as a symbol of the unceasing motion of life, the perpetual motion, hence Buddha's thoughts are said to have been directed by it to the eternal and unchangeable. The leaves of the oak seem to

have suggested the same ideas to the ancient Druids of England.*

The *bat* is the favorite in Hindu worship. The labyrinth of stems, which prevents the form or beginning of the tree from being distinguished, was used in ancient Indian philosophy, to symbolize the difficulty of searching out a foundation of *wisdom*, while the numerous aerial roots sent down represented the bonds in which earthly passions hold the soul; its never ceasing extension and renewal, the eternally revolving course of nature. See the "*Bhagavat gita*" on the *bat*.

The *asoka* tree is worshipped by Hindu women on April 15th; they and their children on that day, to secure themselves from snakes, eat, each one, seven of its flowers.

The *ka'sanda*, a famous Indian pickle, is worshipped by Hindu women, who proceed to the river with all the ingredients, and there worship them; in order to have the gods present, the priest blows the sacred shell.

The *manasá* tree is also worshipped by Hindu females to preserve them from snakes. On the 15th of September, they fling into the river a branch of the *manasá*, which had been planted near their own houses. Near a large *manasá* tree the people assemble, while the snake-catchers of the neighbourhood bring their snakes to the place to make them dance.

The *champa* tree is connected with a curious ceremony, *Vaisaki champá*. A woman wishes to secure herself against widowhood, by placing every day in succession for a month, a Brahman on a couch, feeding him well, fanning him to sleep, and placing a necklace of *champa* flowers round his neck; there is a fresh Brahman every day, and, at the end of the month, the ceremony is concluded by giving the family

* The Greeks had the idea that Jupiter resided in the oak, and they considered the flickering of the leaves an intimation that he heard their prayers.

priest apparel and a golden *champa* flower. It would be easy to enlarge on this subject, by giving an account of the worship connected with the *tulsi*, *bilva*, *durbá*, *kásia*, *nárikel*, and of the use made by Hindus of the flowers of the *ákanda*, *atasi*, *bak*, *bakul*, *bela*, *dhutura*, *gandá*, *javá*, *kadamba*, *kámini*, &c., and to furnish extracts from Indian poets on native plants; but we trust enough has been written to show that whether for business, amusement, or health, the study of indigenous plants is richly deserving the attention of Europeans. Railways will lead Europeans away from cities, and it will be interesting to have solitude sweetened by a familiarity with the plant world, which affords such companionship, that a man in the jungles can say, "he is never less alone than when alone."

The medical value of indigenous plants is a subject of great importance as shewn in the writings of O'Shaughnessy, Wise, Playfair, and Ainslie, but the limits we have assigned to this article will not allow our entering now on this deeply interesting subject.

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